HCD-GNZ77D/GNZ88D

SERVICE MANUAL

E Model

Ver. 1.3 2007. 08

(Photo: HCD-GNZ77D)

- HCD-GNZ77D/GNZ88D are the tuner, deck, DVD and amplifier section in MHC-GNZ77D/GNZ88D.

DVD Section	Model Name Using Similar Mechanism	HCD-GNZ7D/GNZ8D/GNZ9D
	DVD Mechanism Type	CDM74HF-DVBU101//C
	Optical Pick-up Name	KHM-310CAB/C2NP
Tape Deck Section	Model Name Using Similar Machanism	NEW

SPECIFICATIONS

Amplifier section

HCD-GNZ88D

The following measured at AC 120, 127, 220, 240 V, 50/60 Hz

DIN power output (rated)
75 W + 75 W
(4 ohms at 1 kHz, DIN)

Continuous RMS power output (reference)

Front speaker: 100 W + 100 W
(4 ohms at 1 kHz, 10% THD)

Center speaker: 40 W (8 ohms at 1 kHz, 10% THD)

Surround speaker: 40 W + 40 W
(8 ohms at 1 kHz, 10% THD)

HCD-GNZ77D

The following measured at AC 120, 127, 220, 240 V, 50/60 Hz

DIN power output (rated)
75 W + 75 W
(4 ohms at 1 kHz, DIN)

Continuous RMS power output (reference)
100 W + 100 W
(4 ohms at 1 kHz, 10% THD)

Inputs

VIDEO INPUT (phono jacks):
VIDEO: 1 Vp-p, 75 ohms
AUDIO L/R: Voltage 250 mV, impedance 47 kilohms

TV/SAT AUDIO IN L/R (phono jack):
Voltage 250 mV/450 mV, impedance 47 kilohms

Outputs

VIDEO OUT (phono jack):
max. output level
1 Vp-p, unbalanced, Sync negative load impedance
75 ohms

COMPONENT VIDEO OUT:
Y: 1 Vp-p, 75 ohms
PB/CB: 0.7 Vp-p, 75 ohms
PR/CR: 0.7 Vp-p, 75 ohms

S-VIDEO OUT (4-pin/mini-DIN jack):
Y: 1 Vp-p, unbalanced, Sync. negative
C: 0.286 Vp-p, load impedance 75 ohms

PHONES (stereo mini jack):
Accepts headphones of 8 ohms or more

FRONT SPEAKER: Use only the supplied speakers

SURROUND SPEAKER (HCD-GNZ88D):
Use only the supplied speakers

CENTER SPEAKER (HCD-GNZ88D):
Use only the supplied speakers

SUB WOOFER OUT (phono jack):
Voltage 250 mV, impedance 1 kilohm

– Continued on next page –

DVD DECK RECEIVER

9-887-258-04
2007H04-1
© 2007. 08
Sony Corporation
Personal Audio Division
Published by Sony Techno Create Corporation

SONY®

SECTION 3
TEST MODE

[PANEL TEST MODE]

- This mode is used to check the fluorescent indicator tube, LEDs, keys, VOLUME jog, model, destination, software version and VACS level.

Procedure:

1. Press ■ button, ILLUMINATION button and DISC 2 button simultaneously.
2. All LEDs and segments in fluorescent indicator tube are lighted up. All LEDs are lighted up in red color where the SUB WOOFER ON/OFF LED is lighted up in green color.
3. When you want to enter to the software version dispaly mode, press DISC 1 button. The model information appears on the fluorescent indicator tube. Press DISC 1 button again to view the destination information.
4. Each time DISC 1 button is pressed, the display changes from MC version, SYS version, UI version, DVD version, CDMA version, CDMB version, ST version, TA version, TM version, TC version in this order, and returns to the model version display.
5. When DISC 3 button is pressed while the version numbers are being displayed except model and destination, the date of the software creation appears. When DISC 3 button is pressed again, the display returns to the software version display. When DISC 1 button is pressed while the date of the software creation is being displayed, the date of the software creation is displayed in the same order of software version display.
6. Press DISC 2 button, the key check mode is activated.
7. In the key check mode, the fluorescent indicator tube displays "K 0 V0".
   Turn the OPERATIONAL DIAL clockwise; "K" value increases by one. Turn the OPERATIONAL DIAL counterclockwise; "K" value increases by one. Each time a button is pressed, "K" value increases. Press other keys on main unit to check whether the key is detected. However, once a button has been pressed, it is no longer taken into account.
   "V" value increases in the manner of 0, 1, 2, 3 ... if VOLUME knob is turned clockwise, or it decreases in the manner of 0, 9, 8, 7 ... if VOLUME knob is turned counterclockwise.
8. When DISC 3 button is pressed after all LEDs and segments in fluorescent indicator tube light up, the fluorescent indicator tube displays "VACS A". A is VACS level which is triggered by signal level.
9. When DISC SKIP/EX-CHANGE button is pressed after all LEDs and segments in fluorescent indicator tube light up, alternate segments in fluorescent indicator tube would light up. If you press DISC SKIP/EX-CHANGE button again, another half of alternate segments in fluorescent indicator tube would light up. When DISC SKIP/EX-CHANGE button is pressed again, all segments lights off. Press DISC SKIP/EX-CHANGE button again would cause all segments lights up.
10. To release from this mode, press three buttons in the same manner as step 1, or disconnect the power cord.

[COMMON TEST MODE]

- This mode is used to check operations of the respective sections of Amplifier and Tape.

Procedure:

- To enter Common Test Mode

1. Press ■ button, ILLUMINATION button and DISC 3 button simultaneously.
2. The DVD ring indicators and the line below DVD ring indicator flash synchronously on the fluorescent indicator tube. The function is changed to TV where the function is changed to DVD.

- Check of Amplifier

1. Press EQ BAND/MEMORY button repeatedly until a message "GEQ MAX" appears on the fluorescent indicator tube. GEQ increases to its maximum.
2. Press EQ BAND/MEMORY button repeatedly until a message "GEQ MIN" appears on the fluorescent indicator tube. GEQ decreases to its minimum.
3. Press EQ BAND/MEMORY button repeatedly until a message "GEQ FLAT" appears on the fluorescent indicator tube. GEQ is set to flat.
4. When the VOLUME knob is turned clockwise even slightly, the sound volume increases to its maximum and a message "VOLUME MAX" appears on the fluorescent indicator tube.
5. When the VOLUME knob is turned counterclockwise even slightly, the sound volume decreases to its minimum and a message "VOLUME MIN" appears on the fluorescent indicator tube.

- Tape function

1. When a tape is inserted in Deck B and recording is started, the function is changed to TV automatically. The function is change to DVD automatically when a tape is inserted in Deck B and recording is started. When CD SYNC button is pressed during recording in function, ALC (Automatic Logic Control) is turned on.
2. During recording, press ◀◀ button will stop the recording and the function is changed to TAPE B and rewind the tape in Deck B until the recording start position and playback of the tape in Deck B is started. If the REC PAUSE/START button is pressed for a pause and pressed again to resume recording during recording time, when the tape is rewind, the tape will be rewind until the position where the pause is applied.

- To release from Common Test mode

1. To release from this mode, press I/⏻ button.
2. The cold reset is enforced at the same time.

[COLD RESET]

- The cold reset clears all data including preset data stored in the RAM to initial conditions. Execute this mode when returning the set to the customer.

Procedure:

1. Press I/⏻ button to turn on the system.
2. Press ■ button, ILLUMINATION button, and I/⏻ button simultaneously.
3. The message "COLD RESET" appears on the fluorescent indicator tube. Then, the fluorescent indicator tube becomes blank for a while, and the system is reset.

[VACS ON/OFF]

- This mode is used to switch on and off the VACS (Variable Attenuation Control System).

Procedure:

1. Press I/⏻ button to turn on the system.
2. Press ■ button, DIRECTION button and DISC 1 simultaneously. The message "VACS OFF" or "VACS ON" appears on the fluorescent indicator tube.

[TUNER STEP CHANGE]

- The step interval of AM channels can be toggled between 9 kHz and 10 kHz. This mode is not available for Saudi Arabia and Russia models.

Procedure:
1. Press I/⏻ button to turn on the system.
2. Press TUNER/BAND button repeatedly to select the “AM”.
3. Press I/⏻ button to turn off the system.
4. Press ILLUMINATION button and I/⏻ button simultaneously. The system will turn on automatically. The message “AM 9K STEP” or “AM 10K STEP” appears on the fluorescent indicator tube and thus the channel step is changed.

[DVD SHIP MODE (WITH MEMORY CLEAR)]
- This mode moves the optical pick-up to the position durable to vibration and clears all data including preset data stored in the RAM to initial conditions. Use this mode when returning the set to the customer after repair.

Procedure:
1. Press I/⏻ button to turn on the system.
2. Select DVD function.
3. Press ■ button, DIRECTION button and I/⏻ button simultaneously during “DVD NO DISC” condition. The system will turn off automatically.
4. After the “STANDBY” blinking display finishes, a message “MECHA LOCK” appears on the fluorescent indicator tube and the DVD ship mode is set.

[DVD SHIP MODE (WITHOUT MEMORY CLEAR)]
- This mode moves the optical pick-up to the position durable to vibration. Use this mode when returning the set to the customer after repair.

Procedure:
1. Press I/⏻ button to turn on the system.
2. Select DVD function.
3. Press DVD button and I/⏻ button simultaneously during “DVD NO DISC” condition. The system will turn off automatically.
4. After the “STANDBY” blinking display finishes, a message “MECHA LOCK” appears on the fluorescent indicator tube and the DVD ship mode is set.

[DVD TRAY LOCK MODE]
- This mode let you lock the disc tray. When this mode is activated, the disc tray will not open when OPEN/CLOSE button or DISC SKIP/EX-CHANGE button is pressed. The message “LOCKED” will appears on the fluorescent indicator tube.

Procedure:
1. Press I/⏻ button to turn on the system.
2. Select DVD function.
3. Press ■ button and OPEN/CLOSE button simultaneously and hold down until “LOCKED” or “UNLOCKED” appears on the fluorescent indicator tube (around 5 seconds).

[TCM OFFLINE MODE]
- This mode prevents the system from turning off automatically when TCM is not connected. Therefore, measurements can be done even when TCM is not connected during production.

Procedure:
1. When the system is turned off, press EQ BAND/MEMORY button, TAPE A/B button and I/⏻ button simultaneously. The system will turn on automatically.
2. The message “TCM OFFLINE” will appears on the fluorescent indicator tube.

- To release from TCM Offline Mode
  To release from this mode, perform “COLD RESET” or turn off the power supply.

[TV/SAT SWITCHING]
- This mode let you switch from TV to SAT and vice-versa.

Procedure:
1. Press I/⏻ button to turn on the system.
2. Select TV function.
3. Press TV/SAT button and I/⏻ button simultaneously. The function will change to SAT. Press the same buttons again to change from SAT to TV.

[DVD COLOR SYSTEM]
- This mode let you change the color system of the video output from PAL to NTSC or vice-versa. This mode is not available for Latin American and Russian models.

Procedure:
1. Press I/⏻ button to turn on the system.
2. Select DVD function.
3. Press I/⏻ button again to turn off the system.
4. Press ❚❚ button and I/⏻ button simultaneously. The system will turn on automatically.
   The message “COLOR PAL” or “COLOR NTSC” appears on the fluorescent indicator tube.

[REMOTE DISABLE MODE]
- This mode let you disable the remote commander reception. When this mode is activated, the system will not response if the button on the remote commander is pressed. The message “RM DISABLE” appears on the fluorescent indicator tube.
  This mode is essential for conducting test and repairing when no interruption from the other remote commander is expected. This mode is cancelled automatically when the system is turned off.

Procedure:
1. Press I/⏻ button to turn on the system.
2. Press ■ button, DIRECTION button and DISC 3 button simultaneously until “SIRCS ON” or “SIRCS OFF” appears on the fluorescent indicator tube.

[PROGRESSIVE]
- This mode let you change the format of the video output from the COMPONENT OUT jacks among PROGRESSIVE AUTO, PROGRESSIVE VIDEO and INTERLACE.

Procedure:
1. Press I/⏻ button to turn on the system.
2. Press DVD button and DISPLAY button simultaneously. “P AUTO” or “P VIDEO” or “INTERLACE” appears on the fluorescent indicator tube.

[MTK FIRMWARE DISPLAY]
- This mode is used to display the MTK firmware version.

Procedure:
1. Press I/⏻ button to turn on the system.
2. Press DVD button to switch to DVD function.
3. Press I/⏻ button again to turn off the system.
4. Press ■ button and I/⏻ button. The system turns on automatically.
5. The version of MTK firmware appears on the TV screen.

[DVD SERVICE MODE]
- This mode let you make diagnosis and adjustment easily by using the remote commander and the TV. The instructions, diagnostic results, etc. are given on the on-screen display.

• TEST DISC LIST

Be sure to use the DVD disc that matches the signal standards of your region.

• CD

YEDS-18 (Part No.: 3-702-101-01)
PATD-012 (Part No.: 4-225-203-01)

• DVD SL (Single Layer)

NTSC : HLX-503 (Part No.: J-6090-069-A)
HLX-504 (Part No.: J-6090-088-A)
PAL : HLX-506 (Part No.: J-6090-077-A)

• DVD DL (Dual Layer)

NTSC : HLX-501 (Part No.: J-6090-071-A)
HLX-505 (Part No.: J-6090-089-A)
PAL : HLX-507 (Part No.: J-6090-078-A)

• Procedure to enter to DVD Service Mode:

1. Press I/⏻ button to turn on the system.
2. Select DVD function.
3. Press ■ button and OPEN/CLOSE button simultaneously and then turn the VOLUME knob clockwise.
4. The message “SERVICE IN” appears on the fluorescent indicator tube and the Top Menu of Remocon Diagnosis Menu appears on the on-screen display on the TV. The model name and revision number is displayed at the bottom of the on-screen display.

```
Remocon Diagnosis Menu

0. External Chip Check
1. Servo Parameter Check
2. Drive Manual Operation
3. Emergency History
4. Version Information


Model Name   : GML6DS_ME
IF-con       : Ver. 01.00 (0000)
Syscon       : Ver. 0.302
```

5. To execute each function, press its number by using numeric button on the remote commander.
6. To release from this mode, press I/⏻ button to turn off the system.

• Execute IOP Measurement

In order to execute IOP measurement, the following standard procedures must be followed.

1. From the Top Menu of Remocon Diagnosis Menu, select “2. Drive Manual Operation” by pressing the 2 button on the remote commander. The following screen appears on the on-screen display.

```
Drive Manual Operation

1. Servo Control
2. Track/Layer Jump
3. Manual Adjustment
4. Mecha test Mode
5. MIRR time Adjust
0. Return to Top Menu
```

2. Select “3. Manual Adjustment” by pressing the 3 button on the remote commander. The following screen appears on the on-screen display.

```
Manual Adjust

1. Track Balance Adjust:
2. Track Gain Adjust:
3. Focus Balance Adjust:
4. Focus Gain Adjust:
5. Eg Boost Adjust:
6. Iop:
7. TRV. Level:
8. S curve(FE) Level:
9. RFL(PI) Level:
0. MIRR Time:

↑↓ Change Value
RETURN Return to previous menu
```

3. Select “6. Iop:” by pressing 6 button on the remote commander.
4. Wait until a hexadecimal number appears in the on-screen display as below:

```
Manual Adjust

1. Track Balance Adjust:
2. Track Gain Adjust:
3. Focus Balance Adjust:
4. Focus Gain Adjust:
5. Eg Boost Adjust:
6. Iop. ED:
7. TRV. Level:
8. S curve(FE) Level:
9. RFL(PI) Level:
0. MIRR Time:

↑↓ Change Value
RETURN Return to previous menu
```

5. Convert data from hexadecimal to decimal by using conversion table.
6. Please find the label on the rear of the BU (Base Unit). The default IOP value is written in the label.
7. Subtract between these two values.
8. If the remainder is smaller than 93 (decimal), then it is OK. However if the value is higher than 93, then the BU is defective and need to be change.
9. Press RETURN button on the remote commander to return to previous menu.
10. Press 0 button on the remote commander to return to the Top Menu of Remocon Diagnosis Menu.
11. Press I/⏻ button to turn off the system.

• Check Emergency History

To check the emergency history, please follow the following procedure.

1. From the Top Menu of Remocon Diagnosis Menu, select “3. Emergency History” by pressing the 3 button on the remote commander. The following screen appears on the on-screen display.

```
                    Emg.History Check

Laser Hours         CD      999h        59min
                    DVD     999h        59min

1.  01  05  04  04      00  92  46  00
    00  00  00  00      00  00  23  45
2.  02  02  01  01      00  A9  4B  00
    00  00  00  00      00  00  23  45

[Next] Next Page  [Prev] Prev Page
[0] Return to Top Menu
```

2. You can check the total time when the laser is turned on during playback of DVD and CD from the above menu. The maximum time, which can be displayed are 999h 59min.
3. You can check the error code of latest 10 emergency history from the above menu. To view the previous or next page of emergency history, press [⏮] or [⏭] on the remote commander. The error code consists of

- Error Code

```
                  Example of Error code

1. [01] 05  04  04      00  92  46  00
    00  00  00  00      00  00  23  45
```

The meaning of error code is as below:
01: Communication error (No reply from syscon)
02: Syscon hung up
03: Power OFF request when syscon hung up
19: Thermal shutdown
24: MoveSledHome error
25: Mechanical move error (5 Changer)
26: Mechanical move stack error
30: DC motor adjustment error
31: DPD offset adjustment error
32: TE balance adjustment error
33: TE sensor adjustment error
34: TE loop gain adjustment error
35: FE loop gain adjustment error
36: Bad jitter after adjustment
40: Focus NG
42: Focus layer jump NG
52: Open kick spindle error
51: Spindle stop error
60: Focus on error
61: Seek fail error
62: Read Q data/ID error
70: Lead in data read fail
71: TOC read time out (CD)
80: Can't buffering
81: Unknown media type

- Parameter of error code
  This is the detail of error code.

```
                  Example of Error code

1.  01 [05  04  04      00  92  46  00]
   [00  00  00  00      00  00] 23  45
```

- Time of error code
  This is the laser time when an error occurred.

```
                  Example of Error code

1.  01  05  04  04      00  92  46  00
    00  00  00  00      00  00 [23  45]
```

To clear the Laser Hour

Press [DISPLAY] button and then press [CLEAR] button. The data for both CD and DVD data are reset.

```
                    Emg.History Check

Laser Hours         CD      0h          0min
                    DVD     0h          0min

1.  01  05  04  04      00  92  46  00
    00  00  00  00      00  00  23  45
2.  02  02  01  01      00  A9  4B  00
    00  00  00  00      00  00  23  45

[Next] Next Page  [Prev] Prev Page
[0] Return to Top Menu
```

To clear the Emergency History

Press [TOP MENU] button and then press [CLEAR] button. The error code for all emergency history would be reset.

```
                    Emg.History Check

Laser Hours         CD      999h        59min
                    DVD     999h        59min

1.  00  00  00  00      00  00  00  00
    00  00  00  00      00  00  00  00
2.  00  00  00  00      00  00  00  00
    00  00  00  00      00  00  00  00

[Next] Next Page  [Prev] Prev Page
[0] Return to Top Menu
```

To clear the Initialize Setup Data

Press [MENU] button and then press [CLEAR] button on the remote commander.

```
                    Emg.History Check

Laser Hours         CD      999h        59min
                    DVD     999h        59min

Initialize setup data...




[Next] Next Page  [Prev] Prev Page
[0] Return to Top Menu
```

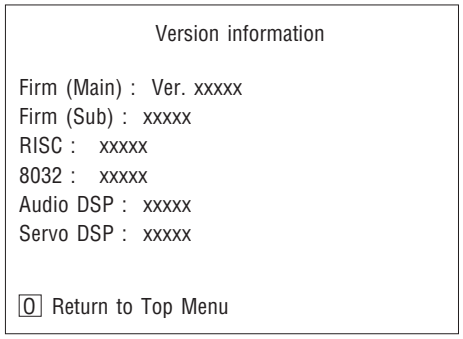
To return to the Top Menu of Remocon Diagnosis Menu

Press [0] button on the remote commander.

- Check Version Information

  To check the version information, please follow the following procedure.

1. From the Top Menu of Remocon Diagnosis Menu, select “4. Version Information” by pressing the [4] button on the remote commander. The following screen appears on the on-screen display.



   To return to the Top Menu of Remocon Diagnosis Menu, press [0] on the remote commander.

Precaution

1. Clean the following parts with a denatured alcohol-moistened swab:
   - record/playback heads
   - erase head
   - capstan
   - pinch rollers
   - rubber belts
   - idlers
2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Mode	Torque meter	Meter reading
FWD	CQ-102C	3.06 N • m to 6.96 N • m 31 to 71 g • cm (0.43 – 0.98 oz • inch)
FWD back tension	CQ-102C	0.19 N • m to 0.58 N • m 2 to 6 g • cm (0.02 – 0.08 oz • inch)
REV	CQ-102RC	3.06 N • m to 6.96 N • m 31 to 71 g • cm (0.43 – 0.98 oz • inch)
REV back tension	CQ-102RC	0.19 N • m to 0.58 N • m 2 to 6 g • cm (0.02 – 0.08 oz • inch)
FF/REW	CQ-201B	6.96 N • m to 14.02 N • m 71 to 143 g • cm (0.98 – 1.99 oz • inch)
FWD tension	CQ-403A	9.80 N • m 100 g or more (3.53 oz or more)
REV tension	CQ-403R	9.80 N • m 100 g or more (3.53 oz or more)

SECTION 5
ELECTRICAL ADJUSTMENTS

DVD SECTION

When the optical pick-up assy is replaced, perform the "Execute IOP Measurement".

Execute IOP Measurement (See page 21)

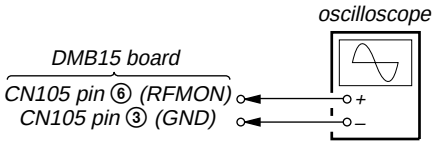
[TEST DISC LIST]

Be sure to use the DVD disc that matches the signal standards of your region.

• CD
YEDS-18 (Part No.: 3-702-101-01)
PATD-012 (Part No.: 4-225-203-01)
• DVD SL (Single Layer)
NTSC : HLX-503 (Part No.: J-6090-069-A)
HLX-504 (Part No.: J-6090-088-A)
PAL : HLX-506 (Part No.: J-6090-077-A)
• DVD DL (Dual Layer)
NTSC : HLX-501 (Part No.: J-6090-071-A)
HLX-505 (Part No.: J-6090-089-A)
PAL : HLX-507 (Part No.: J-6090-078-A)

[RFMON Level Check]

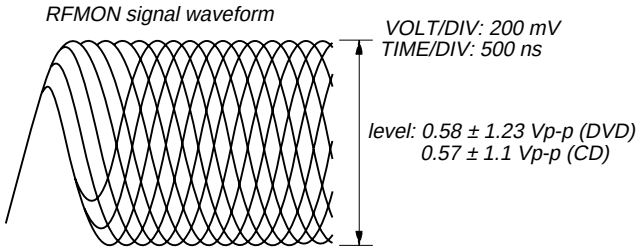
Connection:



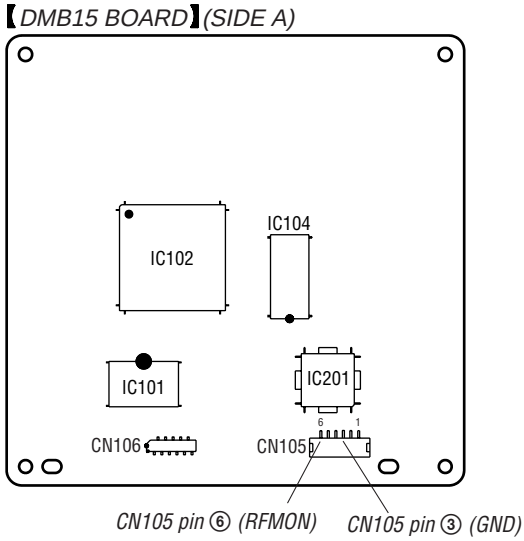
Procedure:

1. Connect an oscilloscope to CN105 pin ⑥ (RFMON) and CN105 pin ③ (GND) on the DMB15 board.
2. Turn the power on.
3. Set the test disc (refer to the TEST DISC LIST) on the tray and press ▷ button to playback.
4. Confirm that oscilloscope waveform is clear and check RFMON signal level is correct or not.

Note: A clear RFMON signal waveform means that the shape "◊" can be clearly distinguished at the center of the waveform.



Checking Location: DMB15 board (Side A)

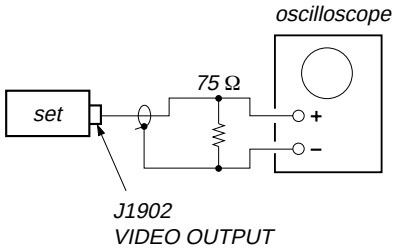


VIDEO SECTION

Video Level Check (VIDEO BOARD)

Purpose

This adjustment is made to satisfy the NTSC standard, and if not adjusted correctly, the brightness will be too large or small.



Procedure:

1. Connect oscilloscope to VIDEO output.
2. Load a DVD reference disc playback.
3. Check the video signal level is 1.00±0.07Vp-p.

DECK SECTION | 0 dB=0.775 V

1. Demagnetize the record/playback head with a head demagnetizer.
2. Do not use a magnetized screwdriver for the adjustments.
3. After the adjustments, apply suitable locking compound to the parts adjust.
4. The adjustments should be performed with the rated power supply voltage unless otherwise noted.
5. The adjustments should be performed in the order given in this service manual. (As a general rule, playback circuit adjustment should be completed before performing recording circuit adjustment.)
6. The adjustments should be performed for both L-CH and R-CH.
7. Switches and controls should be set as follows unless otherwise specified.

• Test Tape

Tape	Signal	Used for
P-4-A063	6.3 kHz, –10 dB	Azimuth Adjustment

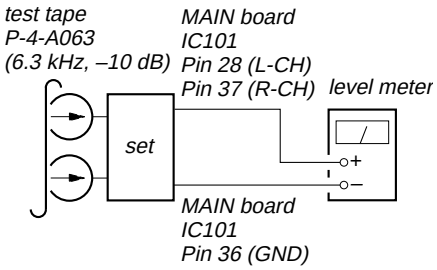
Record/Playback Head Azimuth Adjustment

DECK A **DECK B**

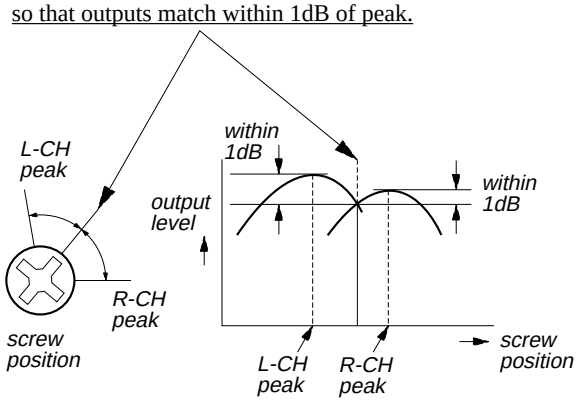
Note: Perform this adjustments for both decks

Procedure:

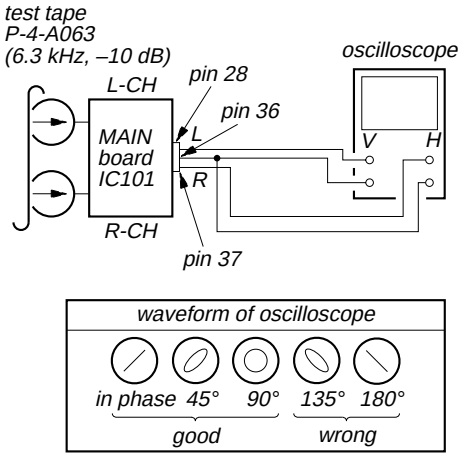
1. Mode: Playback



2. Turn the adjustment screw and check output peaks. If the peaks do not match for L-CH and R-CH, turn the adjustment screw so that outputs match within 1dB of peak.

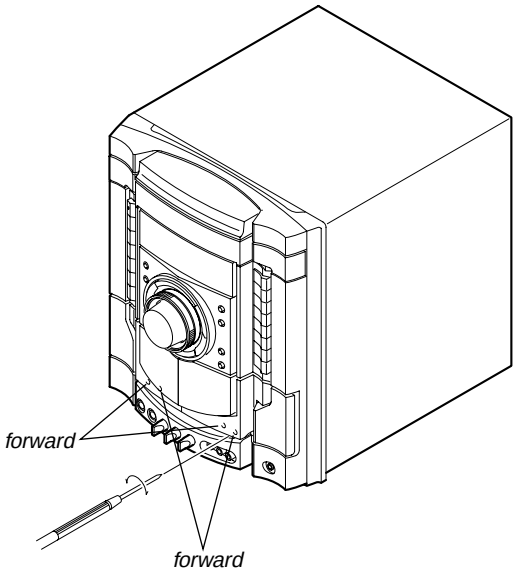


3. Mode: Playback



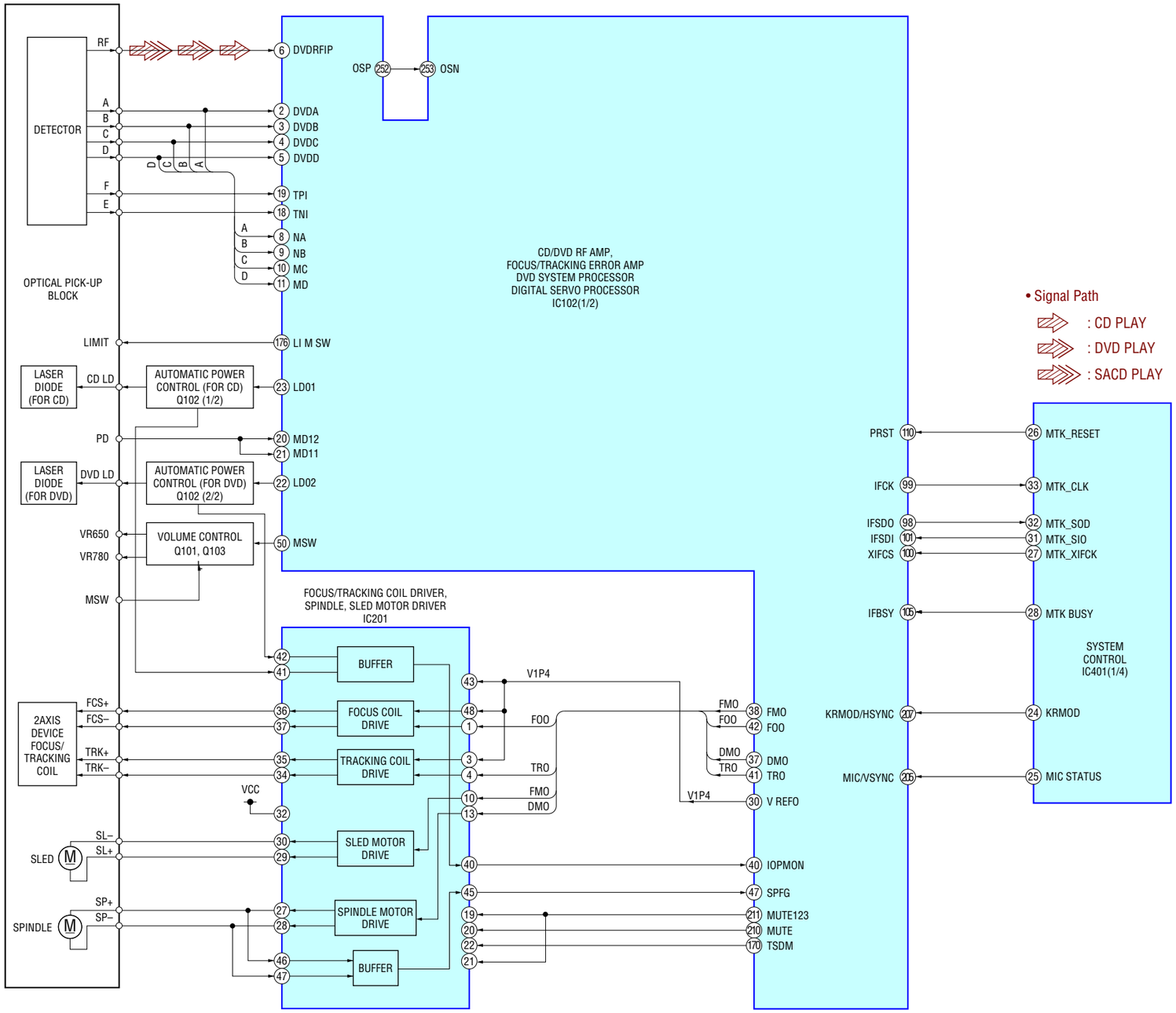
4. After the adjustments, apply suitable locking compound to the pats adjusted.

Adjustment Location: Playback Head (Deck A).
Record/Playback/Erase Head (Deck B).

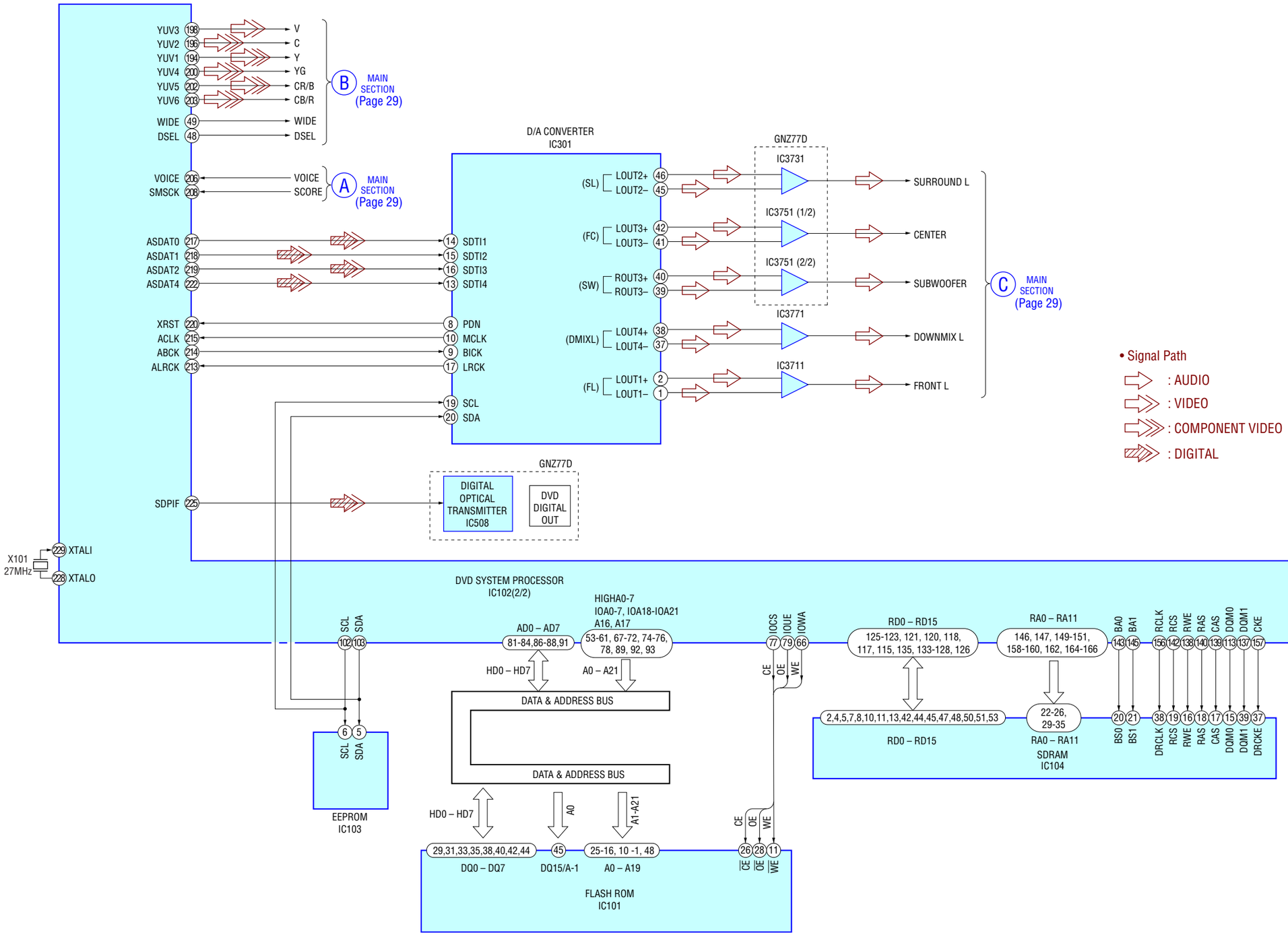


SECTION 6
DIAGRAMS

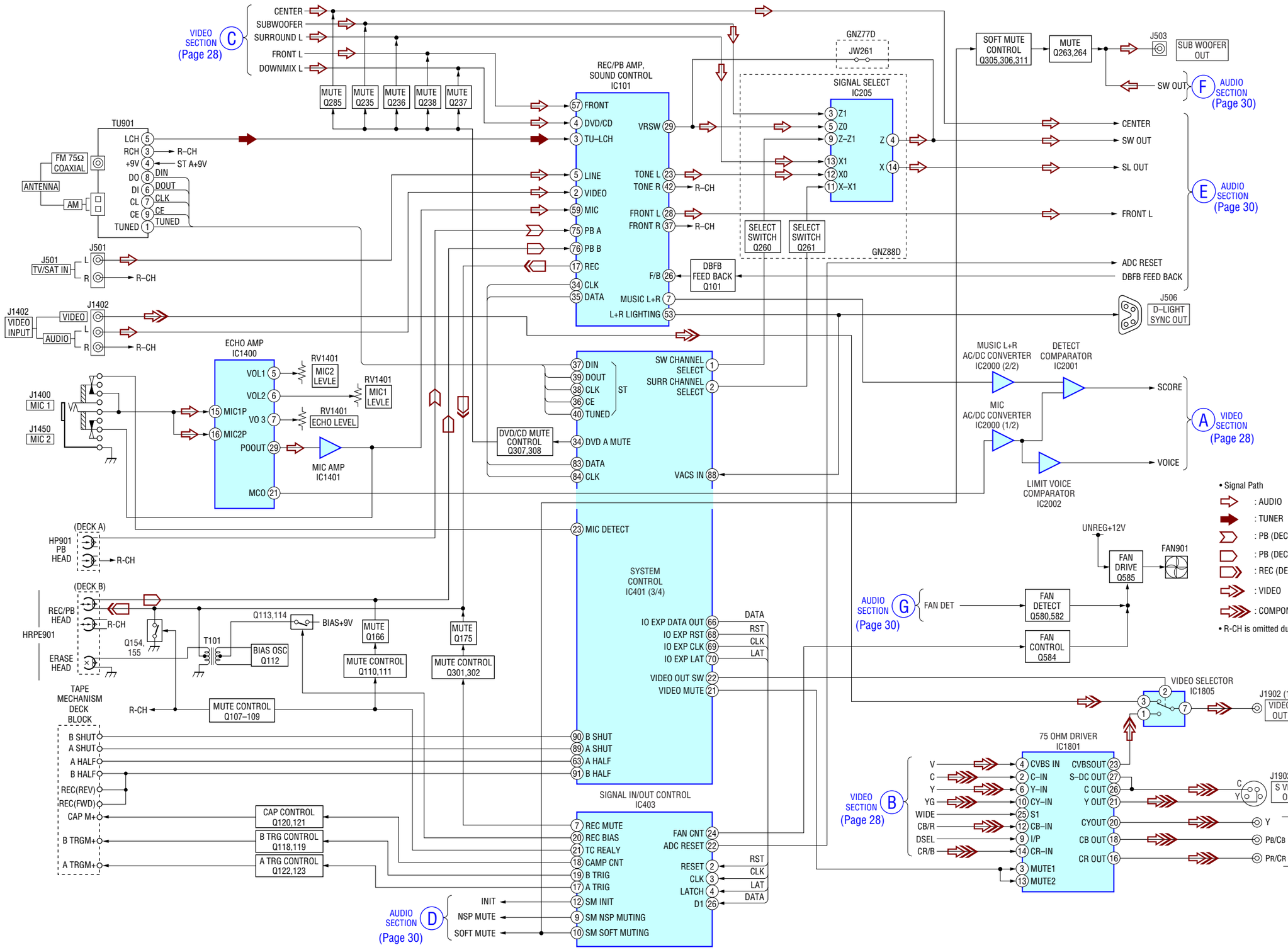
6-1. BLOCK DIAGRAM — RF/SERVO SECTION —



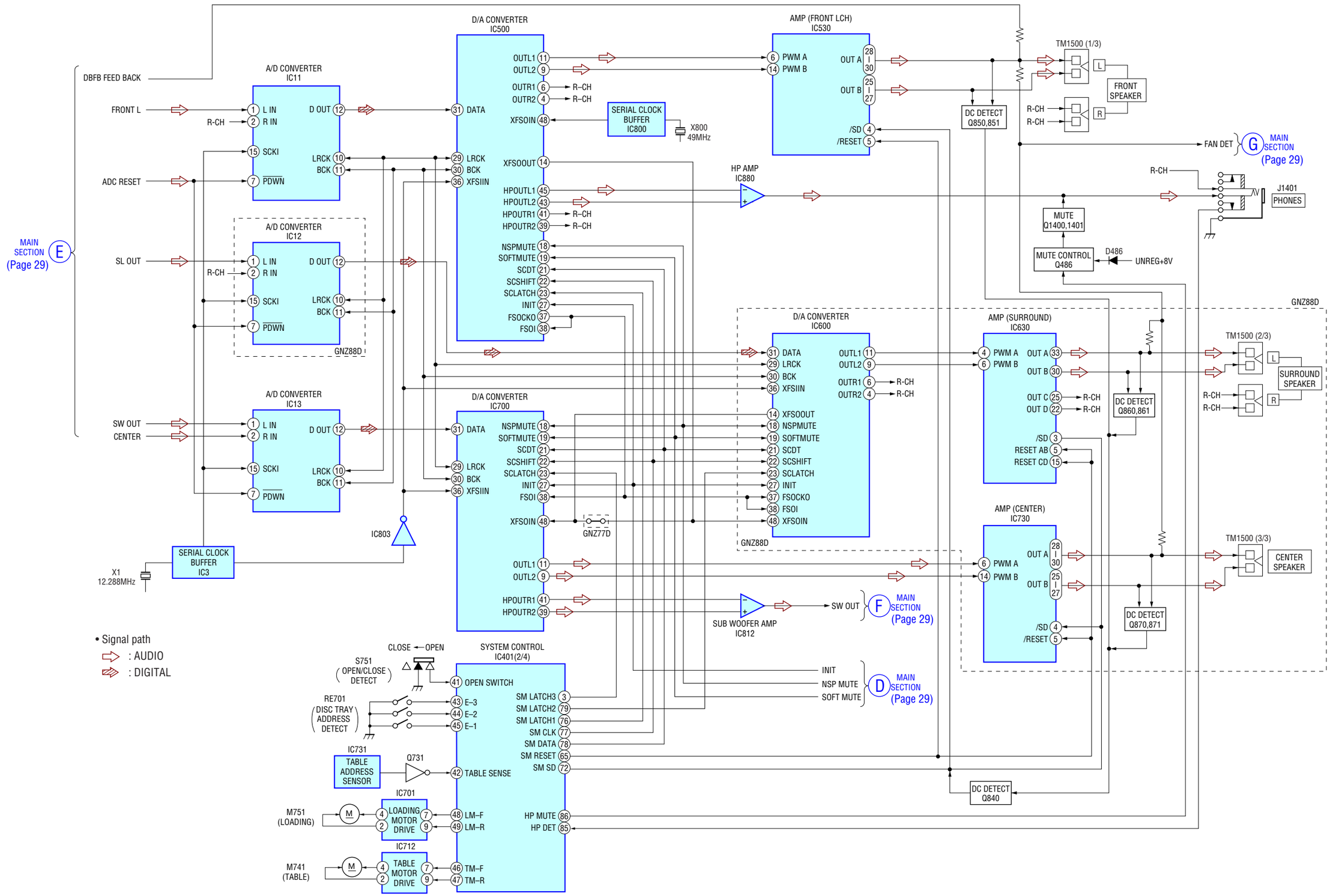
6-2. BLOCK DIAGRAM — VIDEO SECTION —



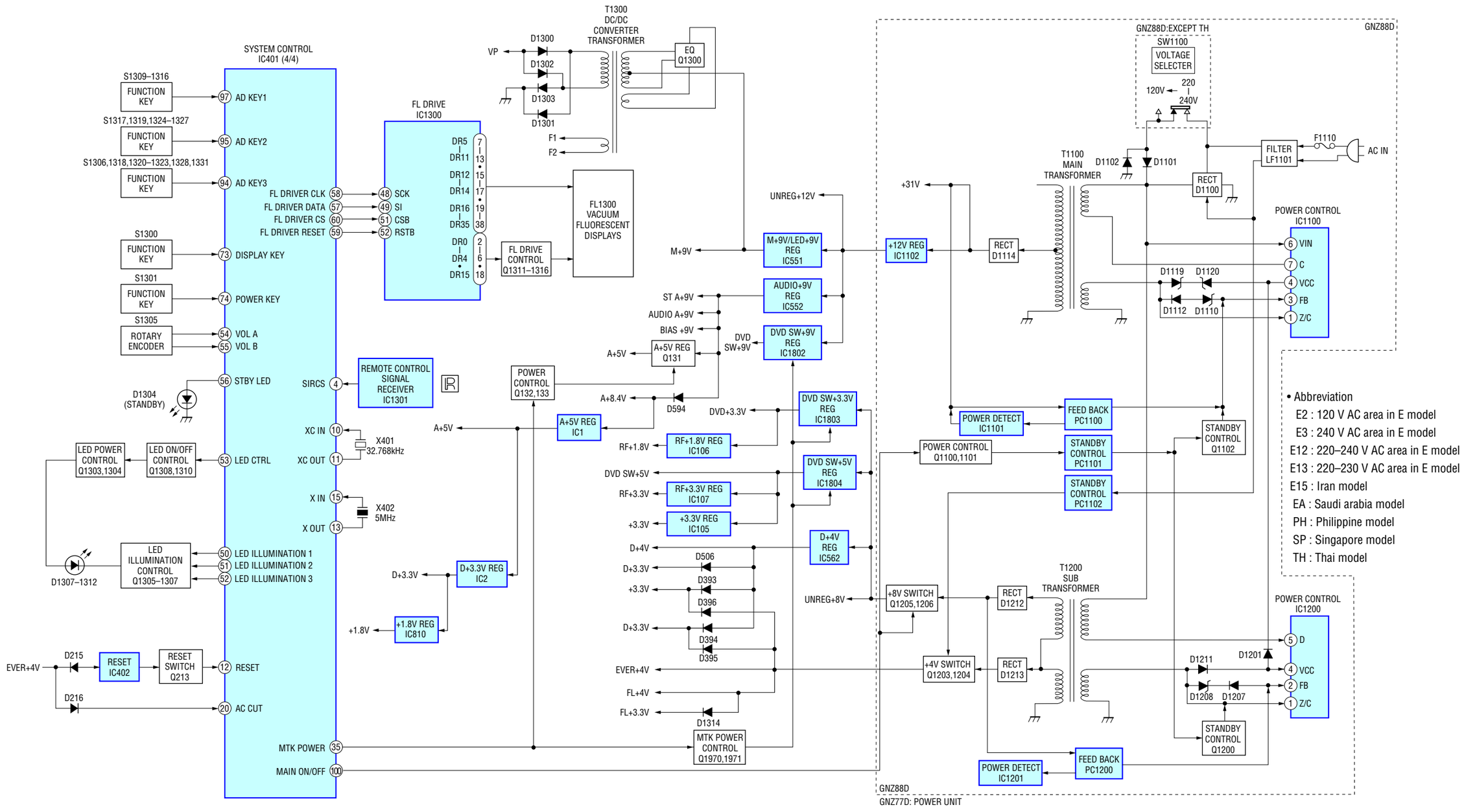
6-3. BLOCK DIAGRAM — MAIN SECTION —



6-4. BLOCK DIAGRAM — AUDIO SECTION —

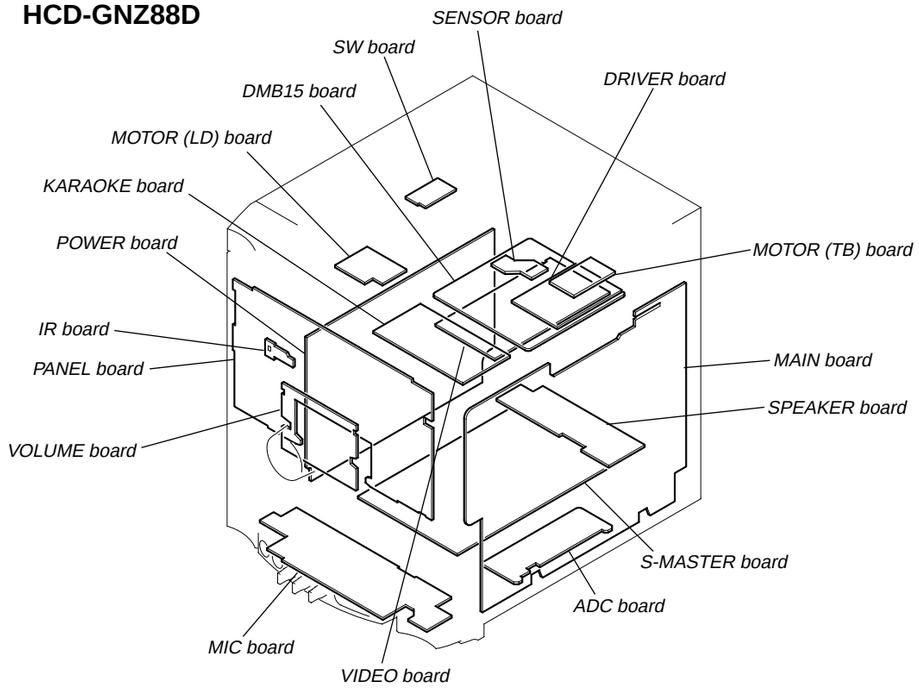


6-5. BLOCK DIAGRAM — FUNCTION/POWER SECTION —

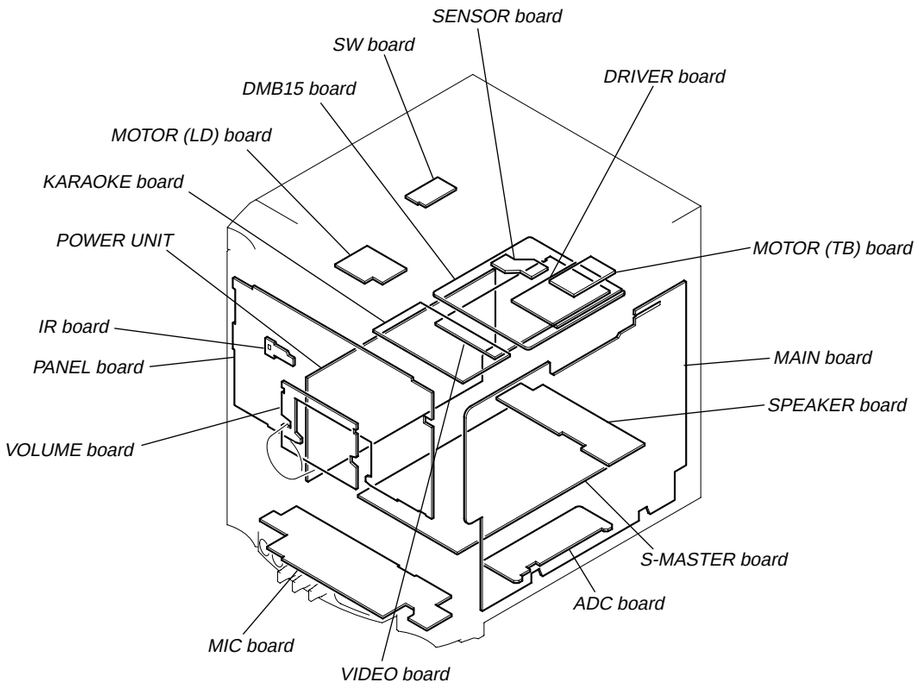


6-6. CIRCUIT BOARDS LOCATION

HCD-GNZ88D



HCD-GNZ77D



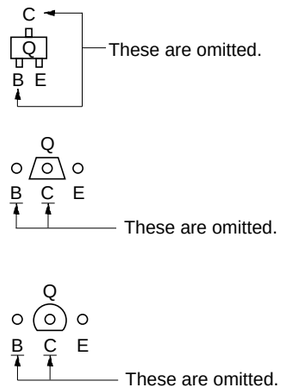
• Note For Printed Wiring Boards And Schematic Diagrams

Note on Printed Wiring Board:

- ○——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ▬▬ : Pattern from the side which enables seeing.
  (The other layer's patterns are not indicated.)

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

- Indication of transistor.



UNLEADED SOLDER

Boards requiring use of unleaded solder are printed with the lead free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size)

: LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40 °C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350 °C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscou-s (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. (p: pF) 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- ⊣▭⊢ : nonflammable resistor.
- ▭ : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

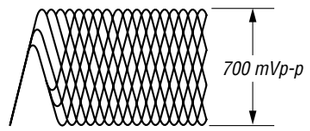
- ▬▬ : B+ Line.
- ▬ ▬ ▬ : B– Line.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
  ✻ : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : AUDIO
  ➡ : TUNER
  ⇨ : VIDEO (COMPONENT)
  ⇨ : VIDEO (COMPOSITE)
  ⇨ : TAPE PLAY (DECK A)
  ⇨ : TAPE PLAY (DECK B)
  ⇨ : TAPE REC (DECK B)
  ⇨ : DVD (AUDIO)
  ⇨ : DVD (RF)
  ⇨ : DVD (DIGITAL)
- Abbreviation

E2	: 120 V AC area in E model
E3	: 240 V AC area in E model
E12	: 220-240 V AC area in E model
E13	: 220-230 V AC area in E model
E15	: Iran model
EA	: Saudi arabia model
PH	: Philippine model
SP	: Singapore model
TH	: Thai model

• **Waveforms**

— DMB15 BOARD —

① IC102 ⑥ (DVDRFIP)

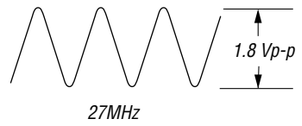


200 mV/DIV, 100 nsec/DIV

④ IC102 ⑲④ (YUV1)

500 mV/DIV, 20 µsec/DIV

⑦ IC102 ㉒⑨ (XTALI)

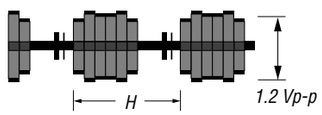


500 mV/DIV, 20 µsec/DIV

② IC102 ㉛ (FED)

100 mV/DIV, 1 msec/DIV

⑤ IC102 ⑲⑥ (YUV2)

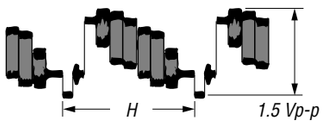


500 mV/DIV, 20 µsec/DIV

③ IC102 ㉜ (TEO)

500 mV/DIV, 1 msec/DIV

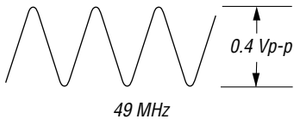
⑥ IC102 ⑲⑧ (YUV3)



500 mV/DIV, 20 µsec/DIV

— S-MASTER BOARD —

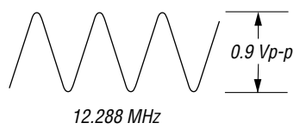
① IC800 ④



0.2 V/DIV, 0.1 µsec/DIV

— ADC BOARD —

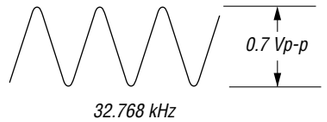
① IC3 ⑥



0.5 V/DIV, 0.1 µsec/DIV

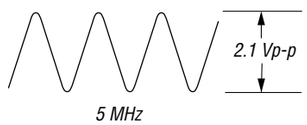
— MAIN BOARD —

① IC401 ⑩ (XC-IN)



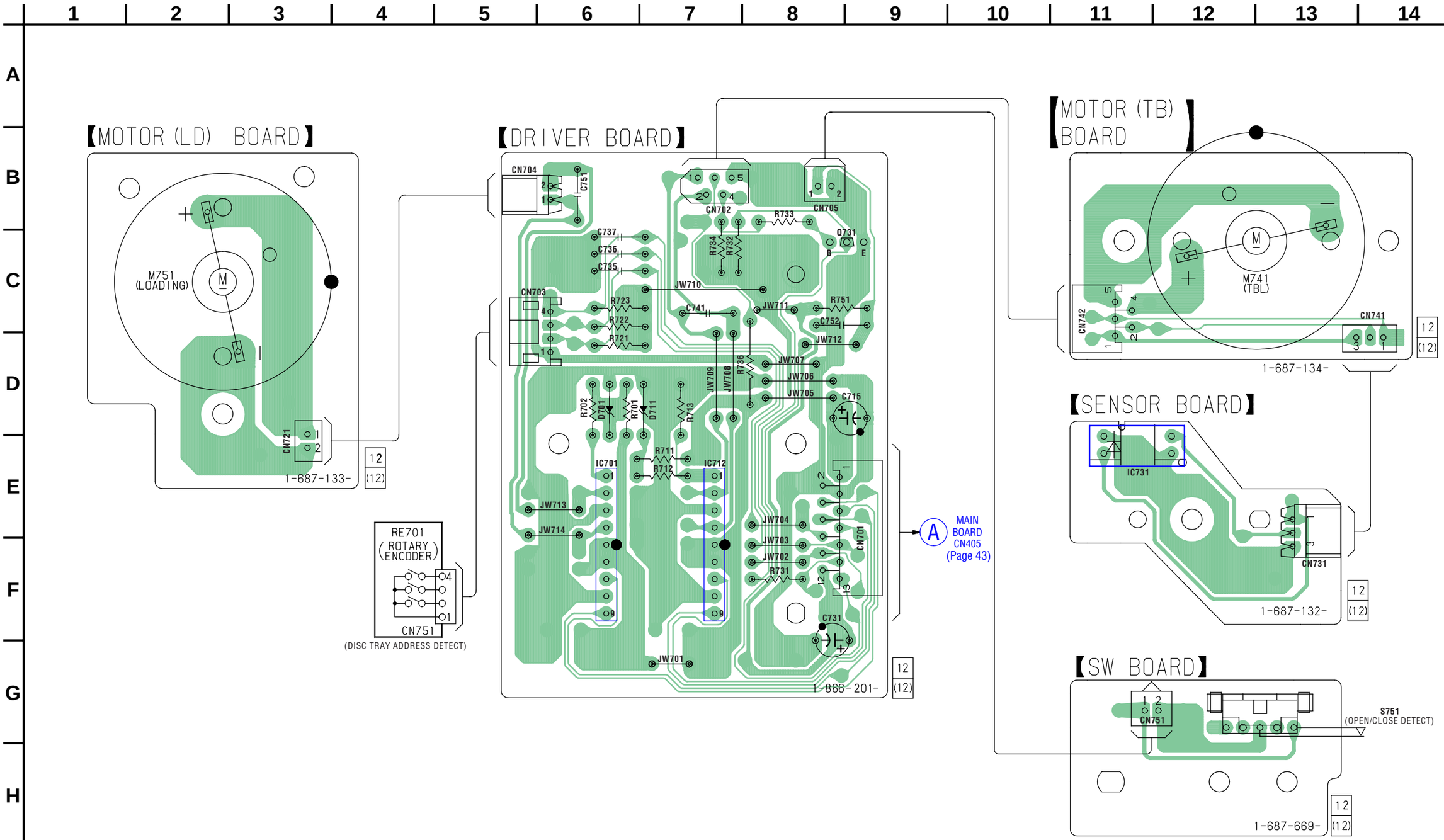
0.5 V/DIV, 20 µsec/DIV

② IC401 ⑬ (X OUT)



1 V/DIV, 0.1 µsec/DIV

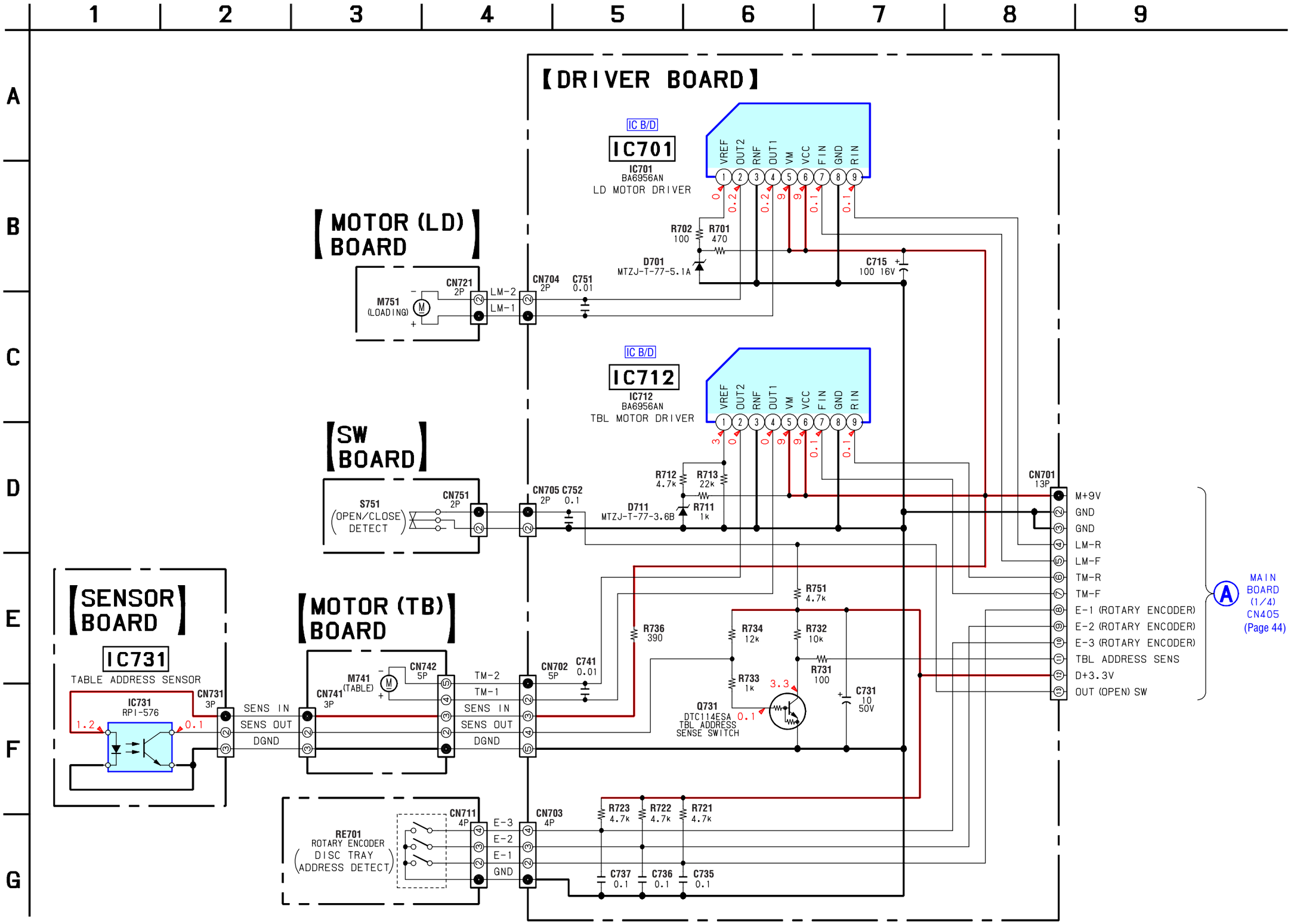
6-7. PRINTED WIRING BOARDS — DRIVER SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



• **Semiconductor Location**

Ref. No.	Location
D701	D-6
D711	D-7
IC701	E-6
IC712	E-7
IC731	E-11
Q731	B-8

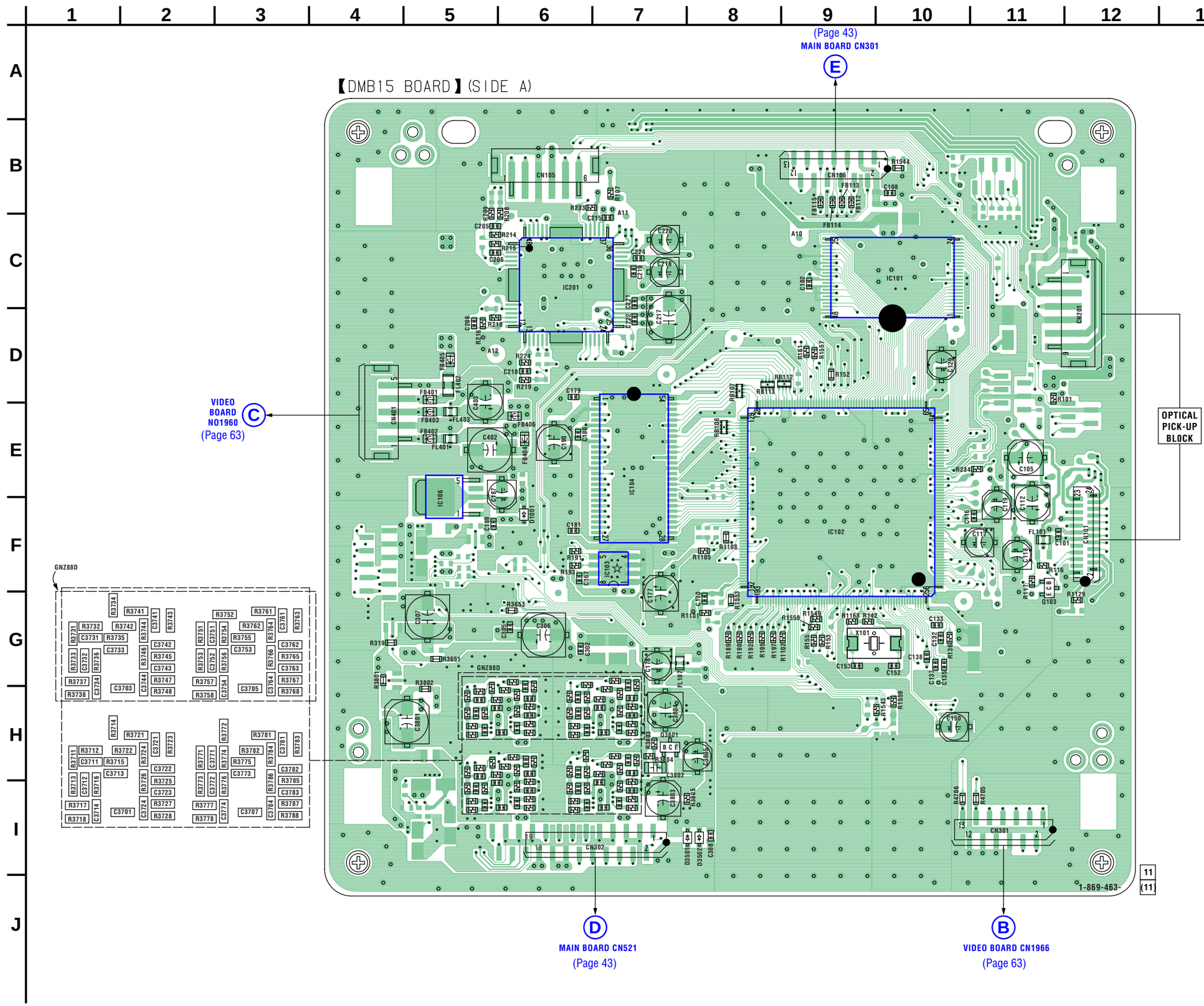
6-8. SCHEMATIC DIAGRAM — DRIVER SECTION — • Refer to page 69 for IC Block Diagrams.



☆ New part of EEPROM (IC103) on the DMB15 board cannot be used. Therefore, if the mounted DMB15 board (A-1167-719-A, etc.) is replaced, exchange new EEPROM (IC103) with that used before the replacement.

6-9. PRINTED WIRING BOARD — DMB15 SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.

【DMB15 BOARD】(SIDE A)

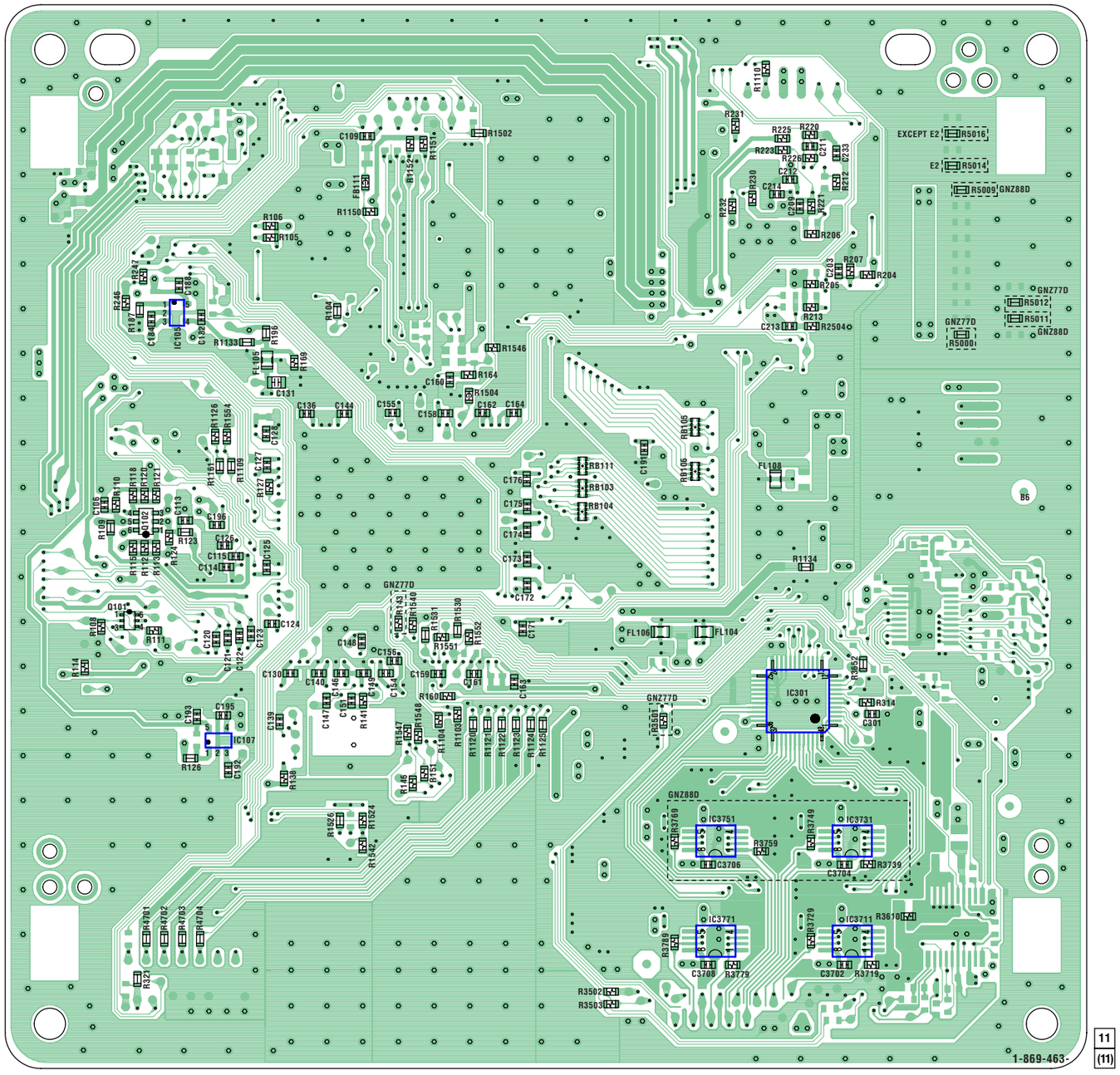


• **Semiconductor Location**

Ref. No.	Location
D1001	F-6
D3501	I-7
D3502	I-8
IC101	C-10
IC102	F-9
IC103	F-7
IC104	E-7
(IC105)	D-10
IC106	E-5
(IC107)	G-10
IC201	C-6
(IC301)	F-6
(IC3711)	H-5
(IC3731)	G-5
(IC3751)	G-6
(IC3771)	H-6
(Q101)	F-11
(Q102)	E-10
Q103	G-11
Q3801	H-7

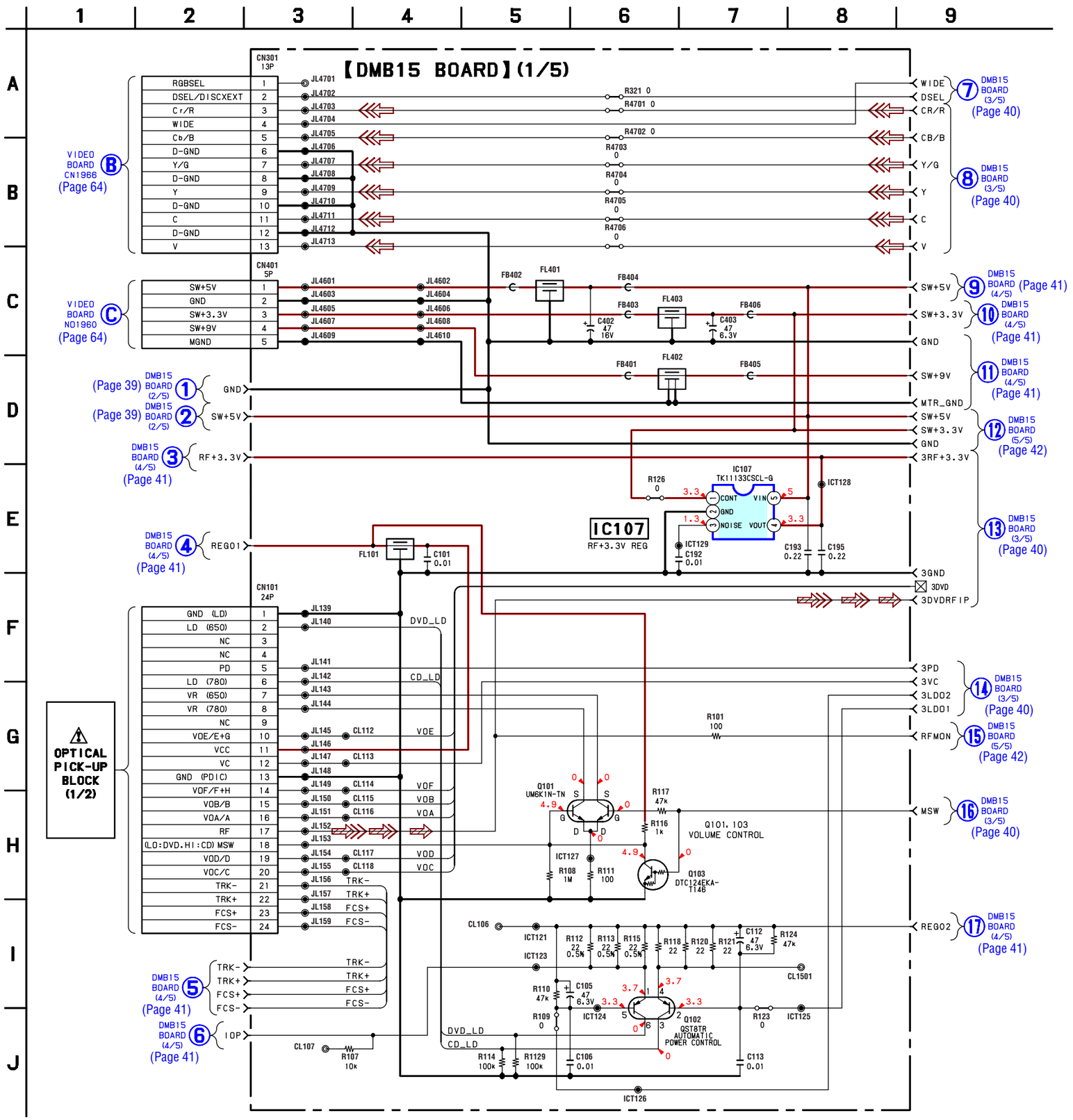
( ): SIDE B

【DMB15 BOARD】(SIDE B)

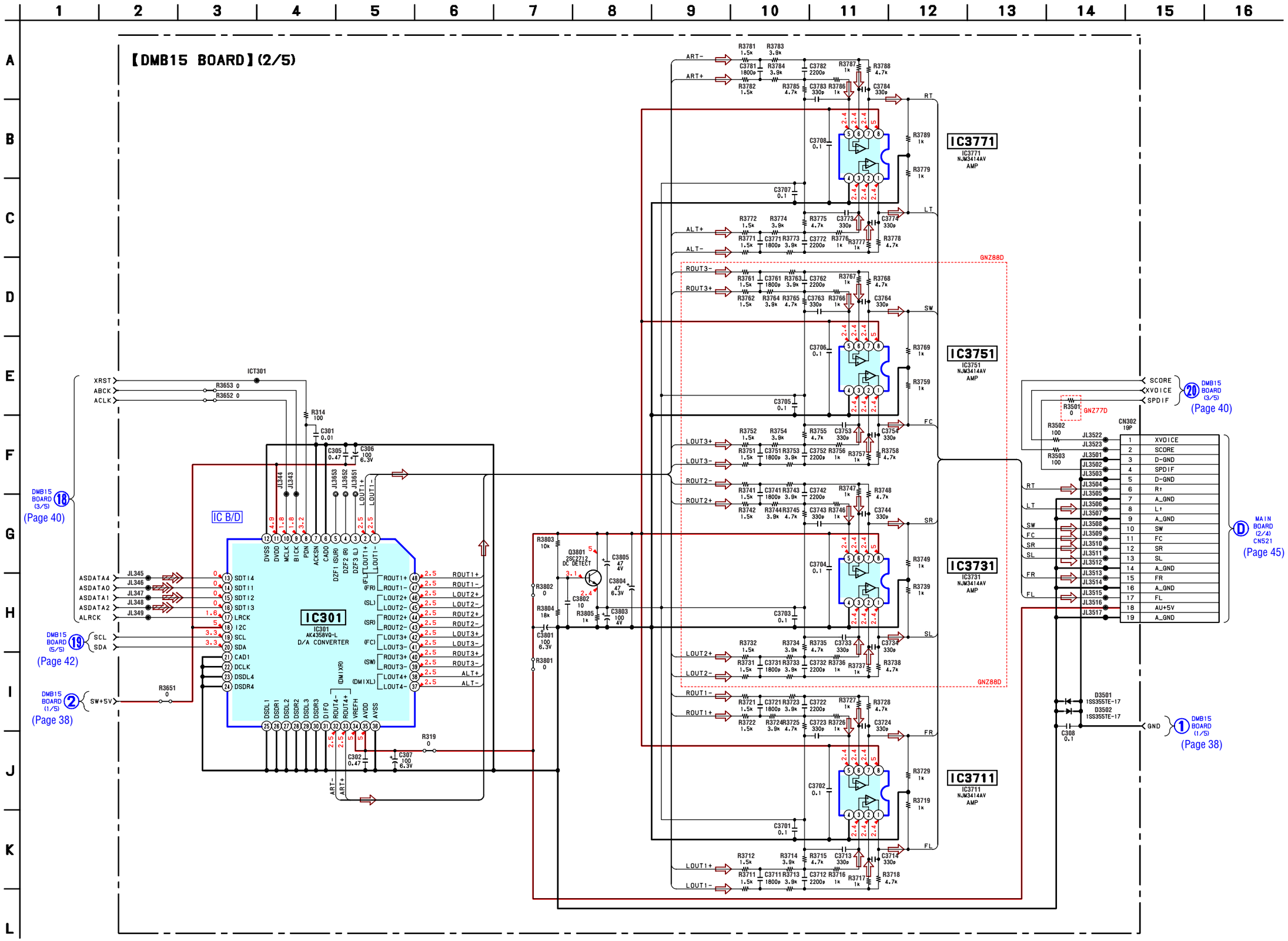


A B C D E F G H I

6-10. SCHEMATIC DIAGRAM — DMB15 SECTION (1/5) —



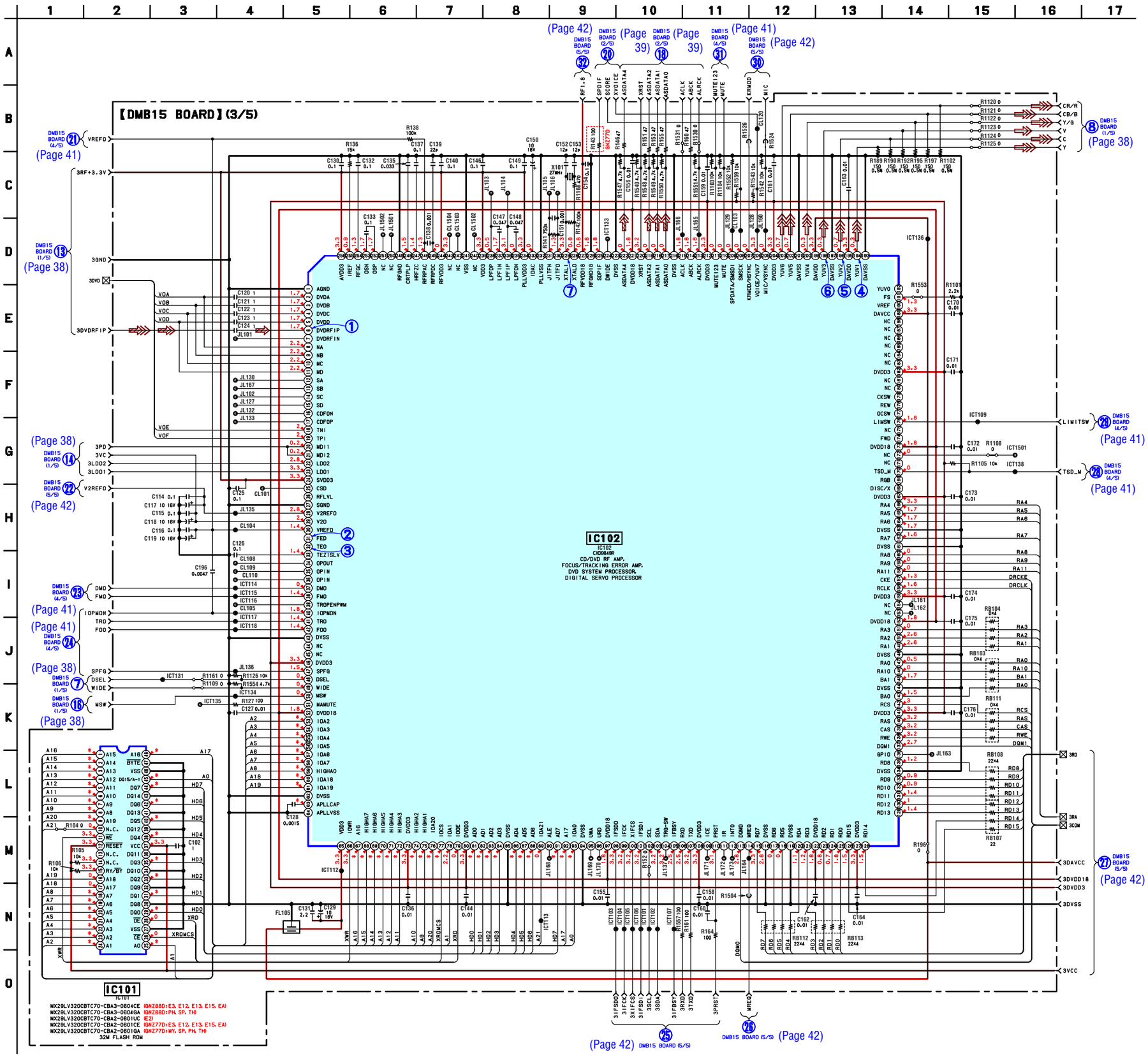
6-11. SCHEMATIC DIAGRAM — DMB15 SECTION (2/5) — • Refer to page 69 for IC Block Diagrams.



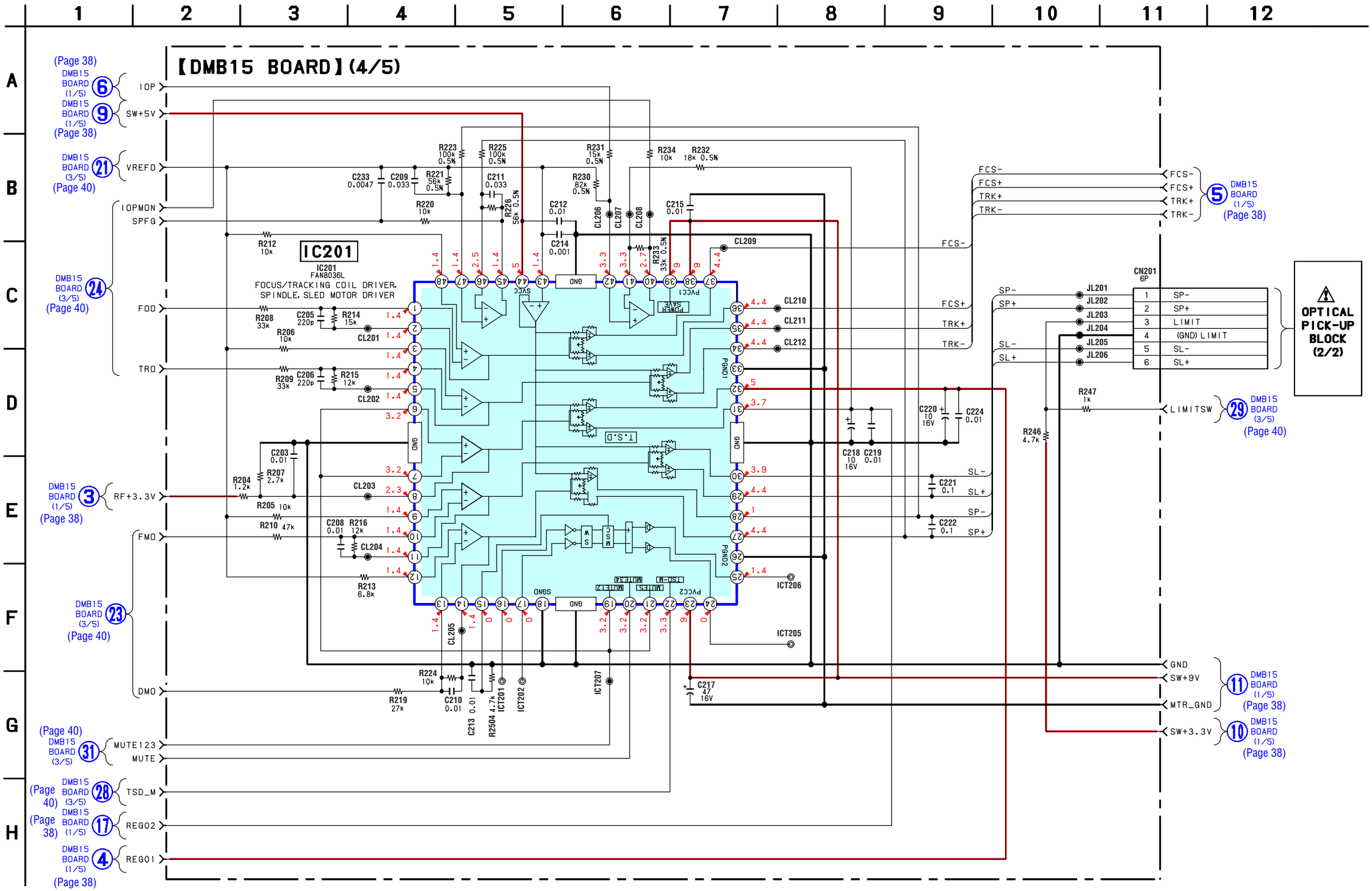
• Refer to page 33 for Waveforms.

6-12. SCHEMATIC DIAGRAM — DMB15 SECTION (3/5) —

• Refer to page 70 for IC Pin Description of IC102.

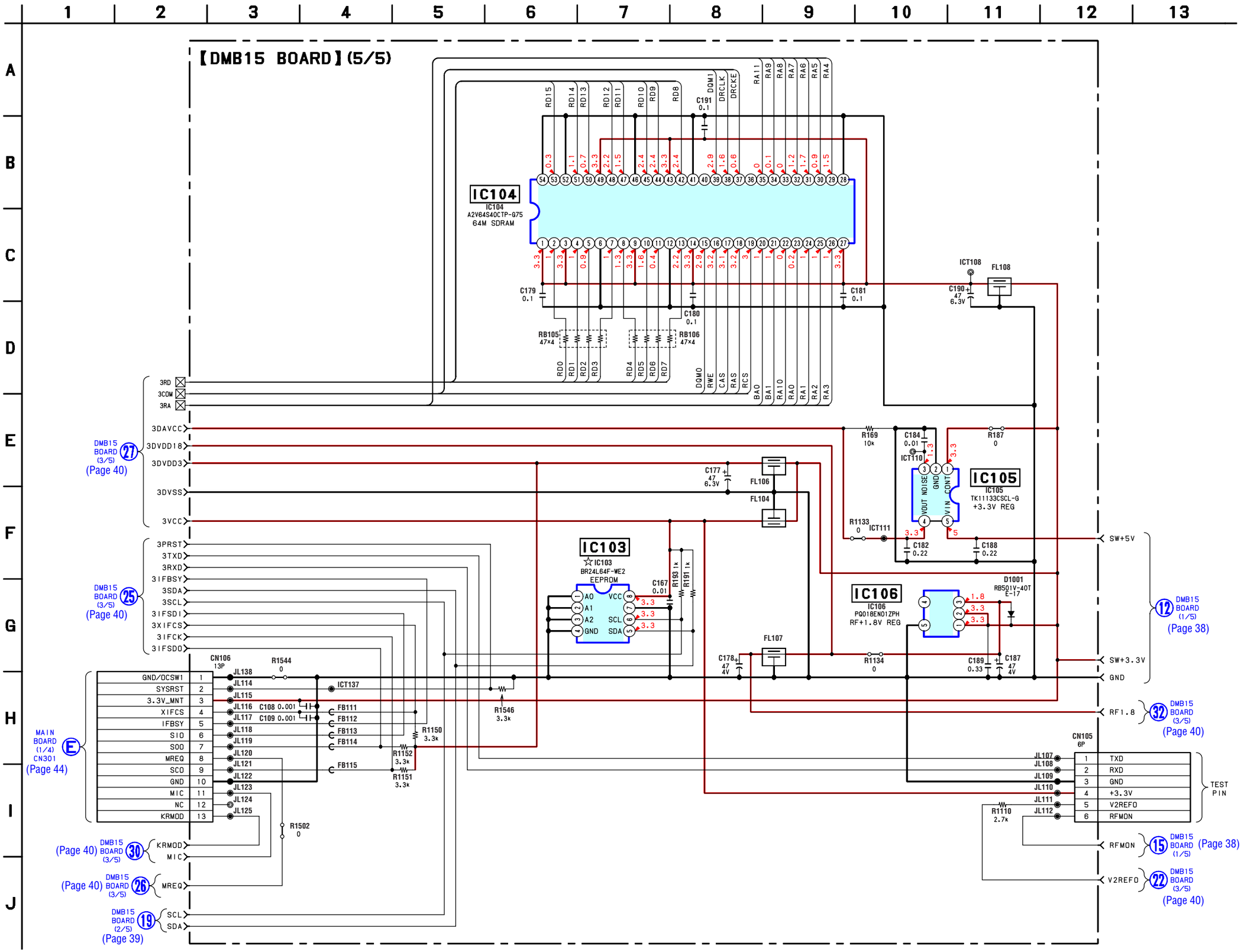


6-13. SCHEMATIC DIAGRAM — DMB15 SECTION (4/5) —

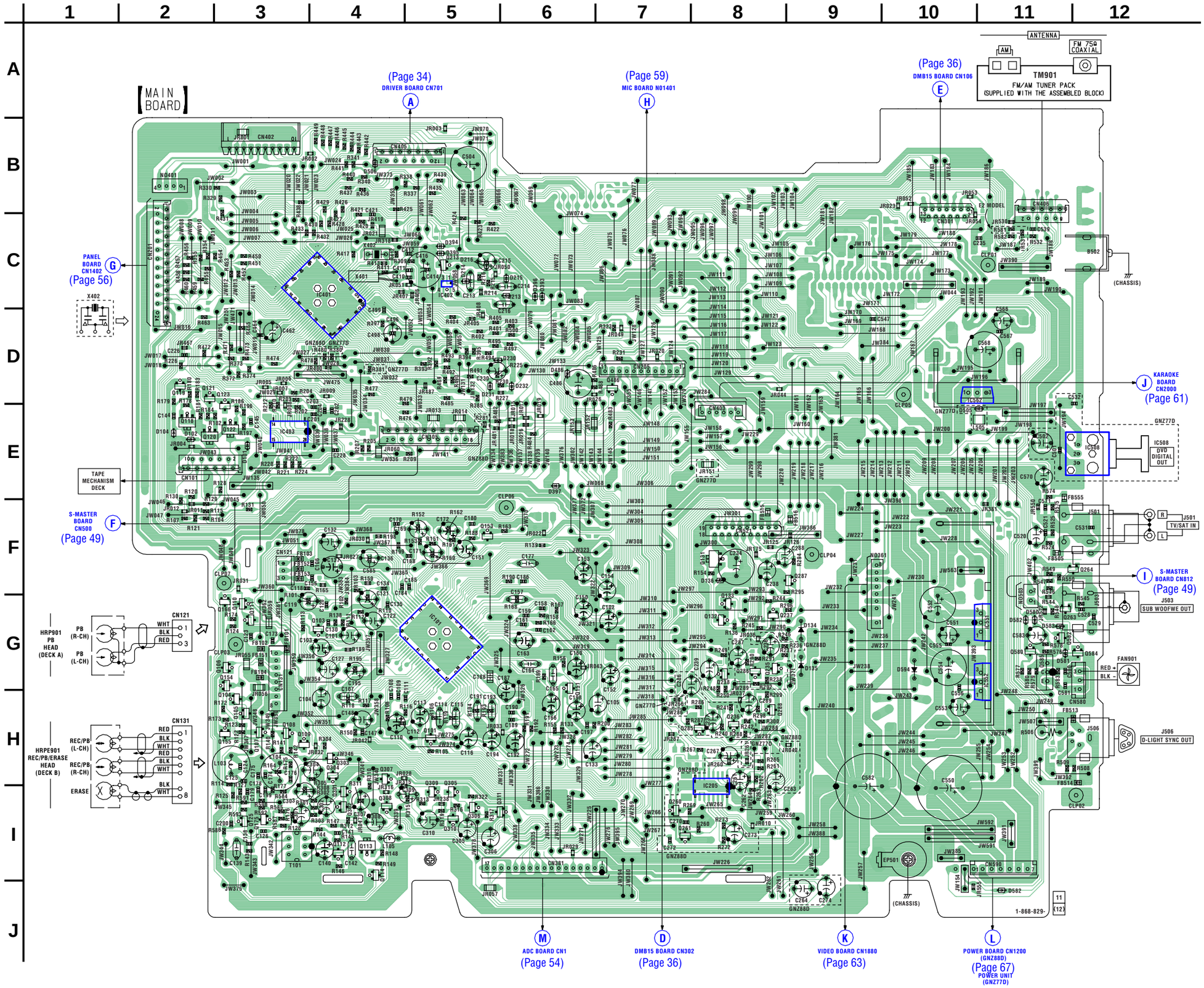


☆ New part of EEPROM (IC103) on the DMB15 board cannot be used. Therefore, if the mounted DMB15 board (A-1167-719-A, etc.) is replaced, exchange new EEPROM (IC103) with that used before the replacement.

6-14. SCHEMATIC DIAGRAM — DMB15 SECTION (5/5) —



6-15. PRINTED WIRING BOARD — MAIN SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



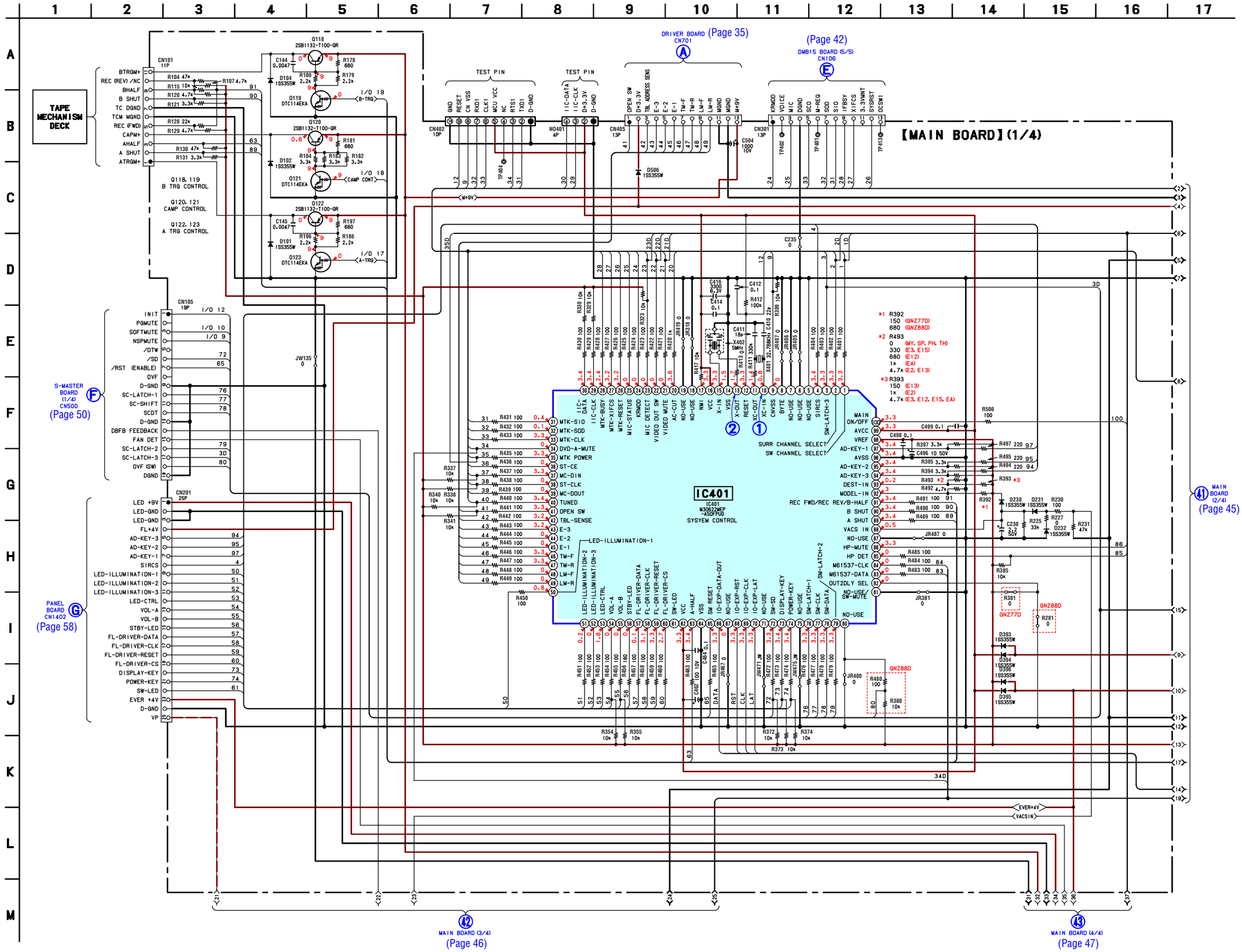
• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D101	E-3	Q112	I-4
D102	E-2	Q113	I-4
D104	E-2	Q114	I-4
D134	G-9	Q118	E-2
D135	G-9	Q119	D-2
D136	F-8	Q120	E-2
D213	C-6	Q121	D-2
D214	C-5	Q122	E-3
D215	C-6	Q123	E-3
D216	C-5	Q125	I-3
D230	D-5	Q131	F-8
D231	D-5	Q132	G-8
D232	D-6	Q133	G-8
D393	C-6	Q151	G-6
D394	C-5	Q153	F-5
D395	C-5	Q154	G-3
D396	C-6	Q155	H-3
D397	E-6	Q166	G-3
D486	D-6	Q175	I-3
D505	E-10	Q213	C-5
D506	B-4	Q235	G-8
D580	G-11	Q236	H-8
D581	G-11	Q237	G-8
D582	G-11	Q238	G-8
D583	G-11	Q260	I-7
D594	G-10	Q261	I-7
		Q263	F-11
IC101	G-5	Q264	F-11
IC205	H-8	Q285	H-8
IC401	C-4	Q286	G-8
IC402	C-5	Q287	F-9
IC403	E-3	Q288	H-8
IC508	E-12	Q301	I-4
IC551	G-11	Q302	I-4
IC552	G-11	Q303	H-4
IC562	D-10	Q304	H-4
		Q305	H-5
Q101	H-5	Q306	I-5
Q103	G-4	Q307	H-4
Q104	H-3	Q308	I-4
Q105	H-3	Q311	H-5
Q106	G-3	Q486	D-7
Q107	H-3	Q580	G-11
Q108	H-3	Q582	G-11
Q109	H-3	Q584	G-12
Q110	G-3	Q585	G-11
Q111	G-3		

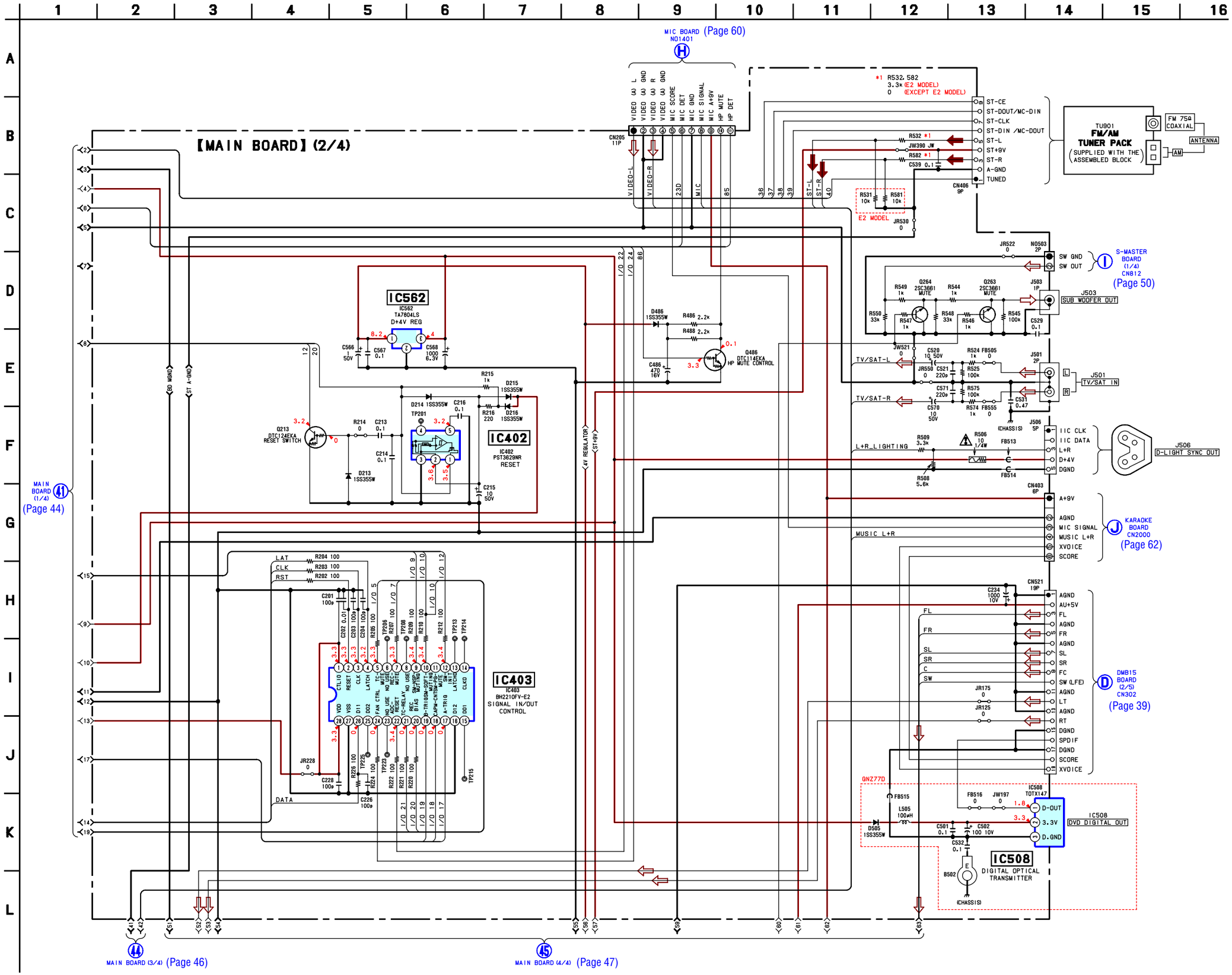
• Refer to page 33 for Waveforms.

6-16. SCHEMATIC DIAGRAM — MAIN SECTION (1/4) —

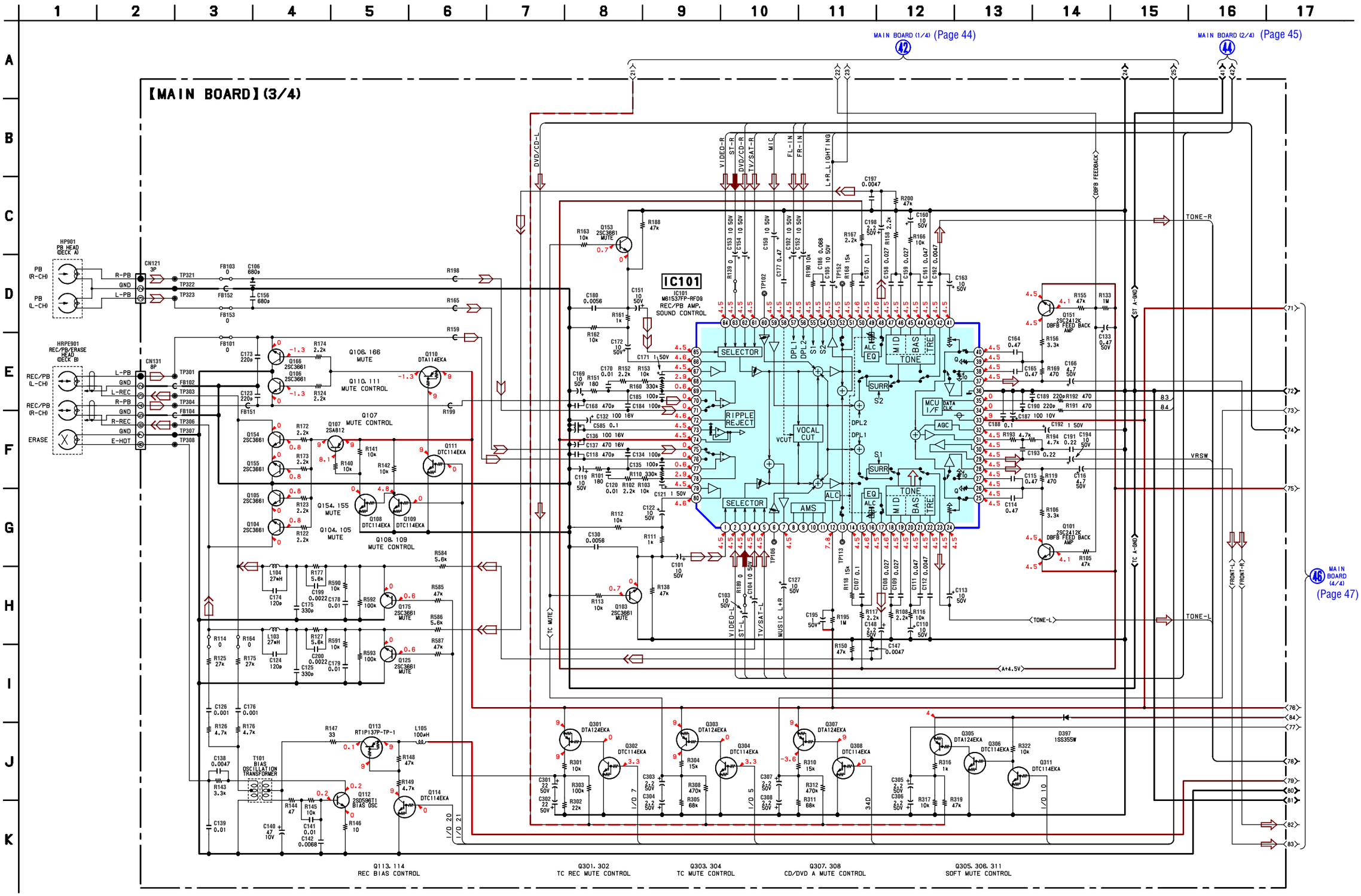
• Refer to page 75 for IC Pin Description of IC401.



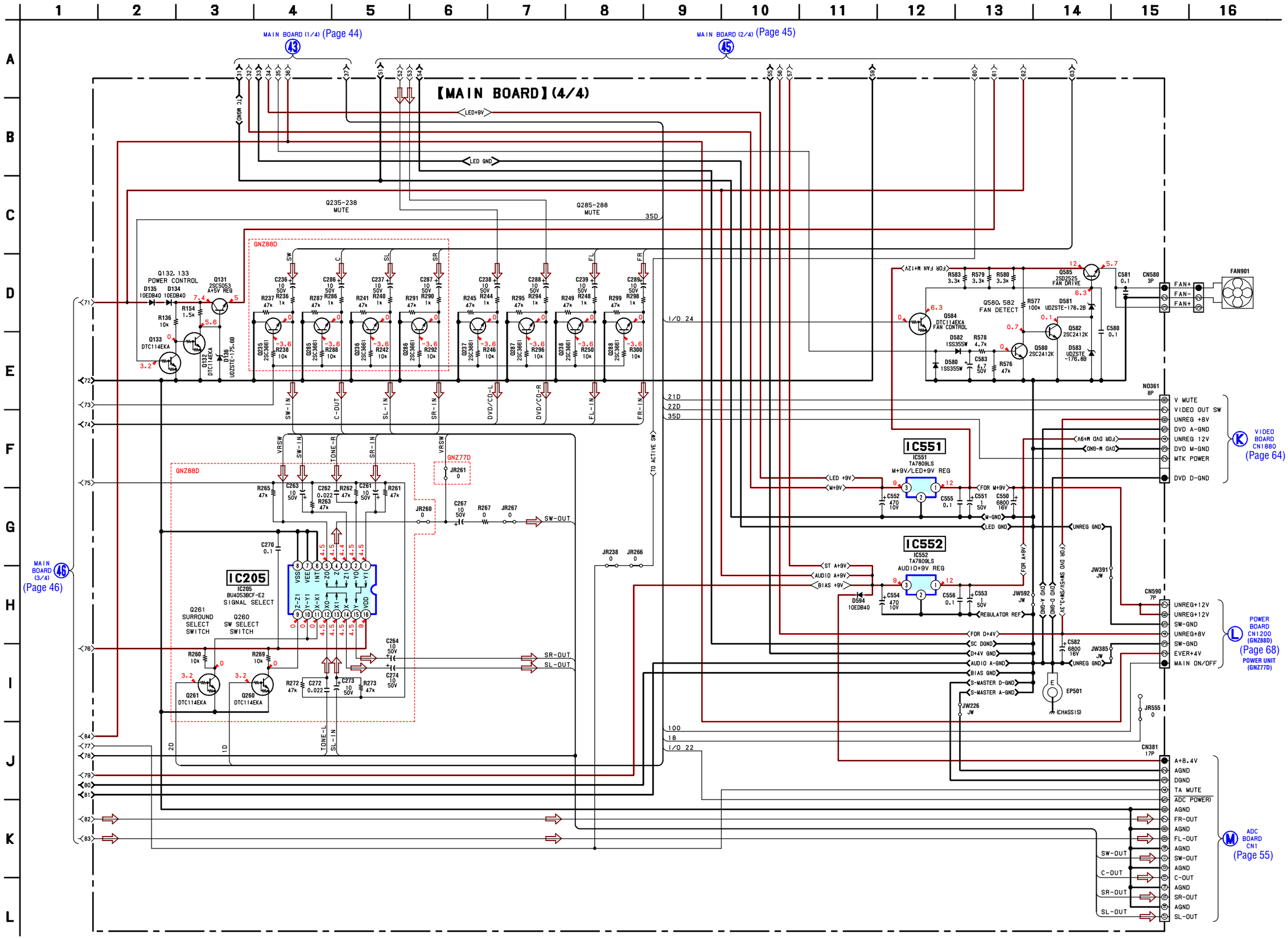
6-17. SCHEMATIC DIAGRAM — MAIN SECTION (2/4) — • Refer to page 78 for IC Pin Description of IC403.



6-18. SCHEMATIC DIAGRAM — MAIN SECTION (3/4) —

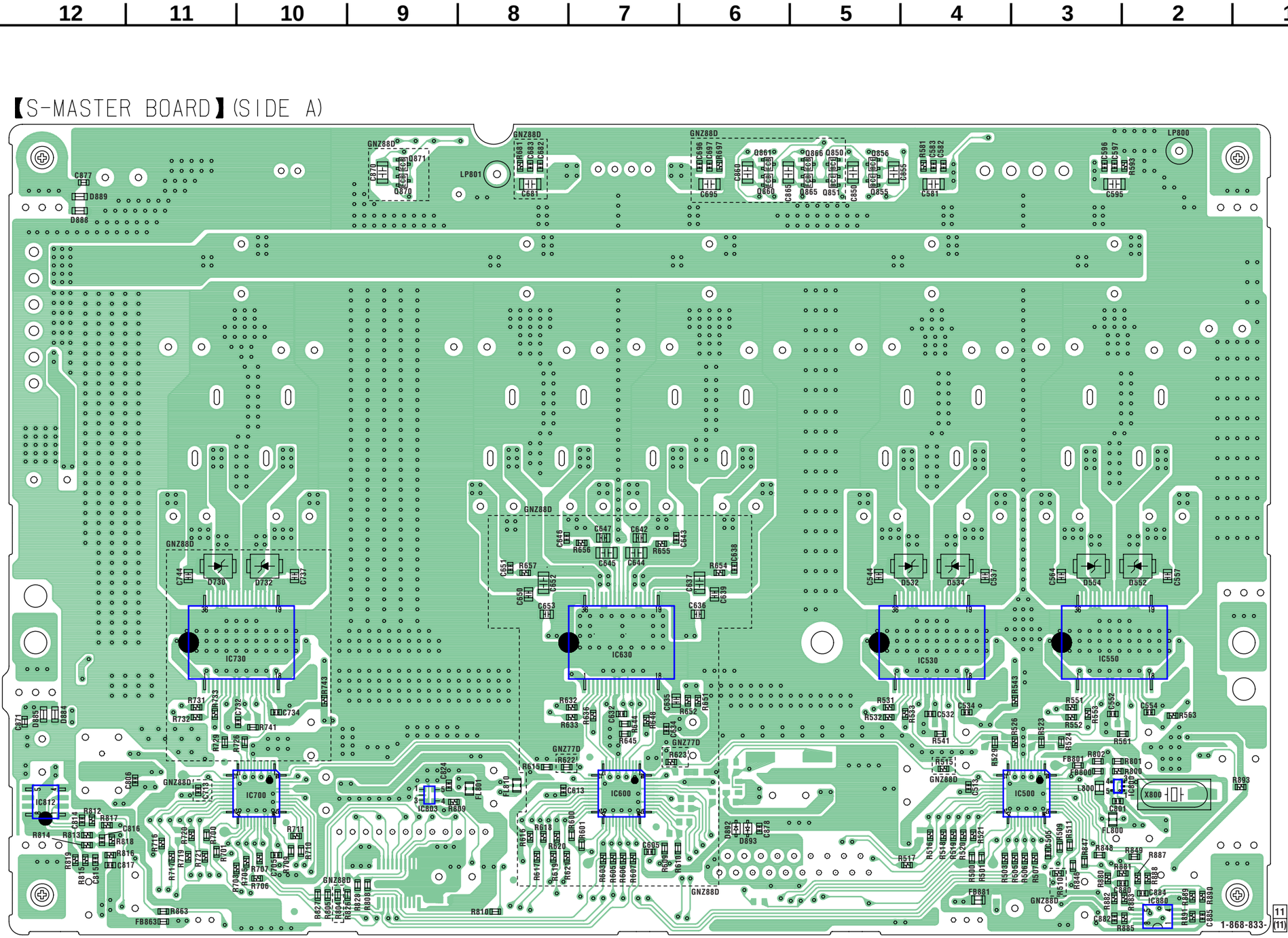


6-19. SCHEMATIC DIAGRAM — MAIN SECTION (4/4) —



6-20. PRINTED WIRING BOARD — S-MASTER SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.

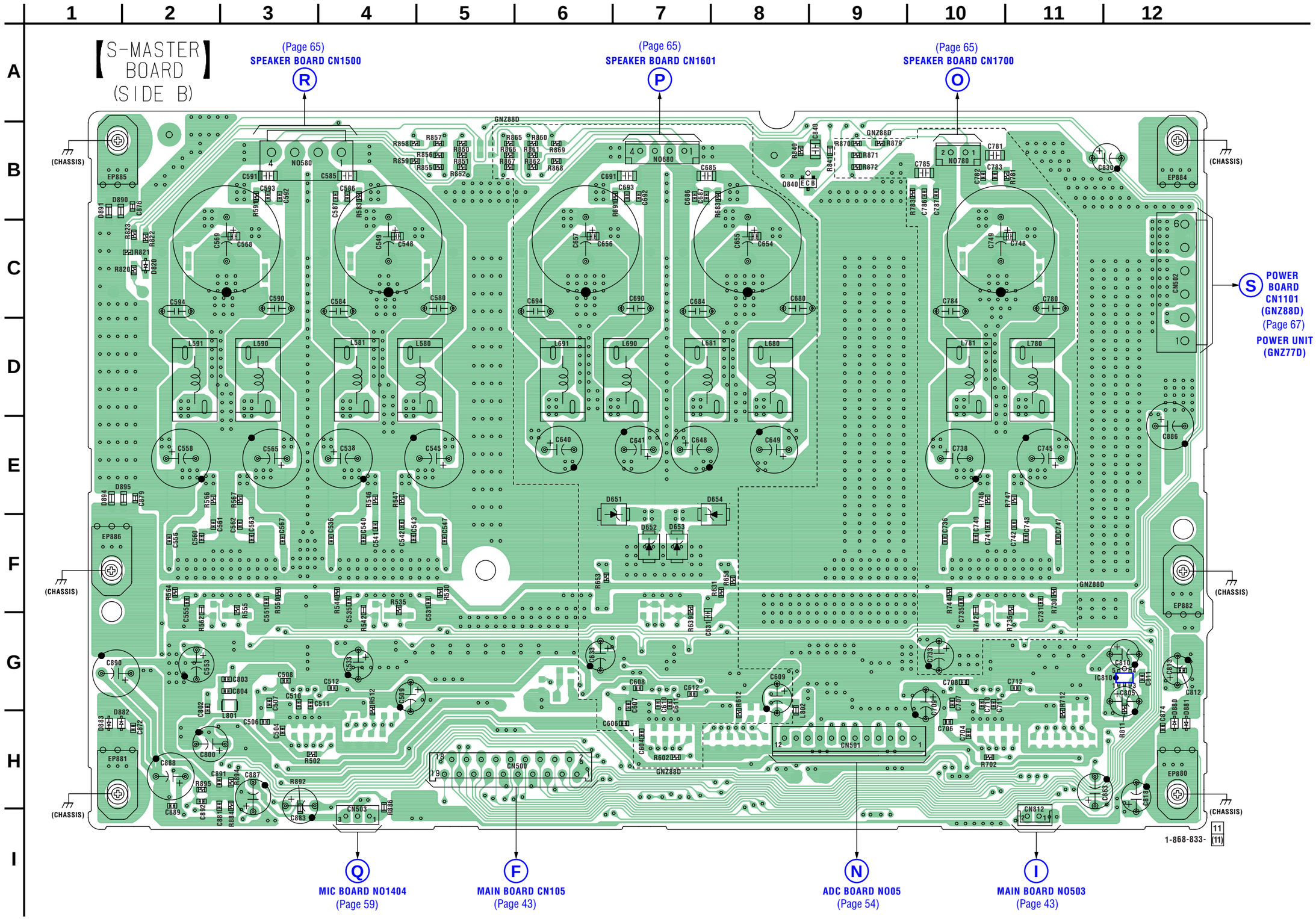
【S-MASTER BOARD】(SIDE A)



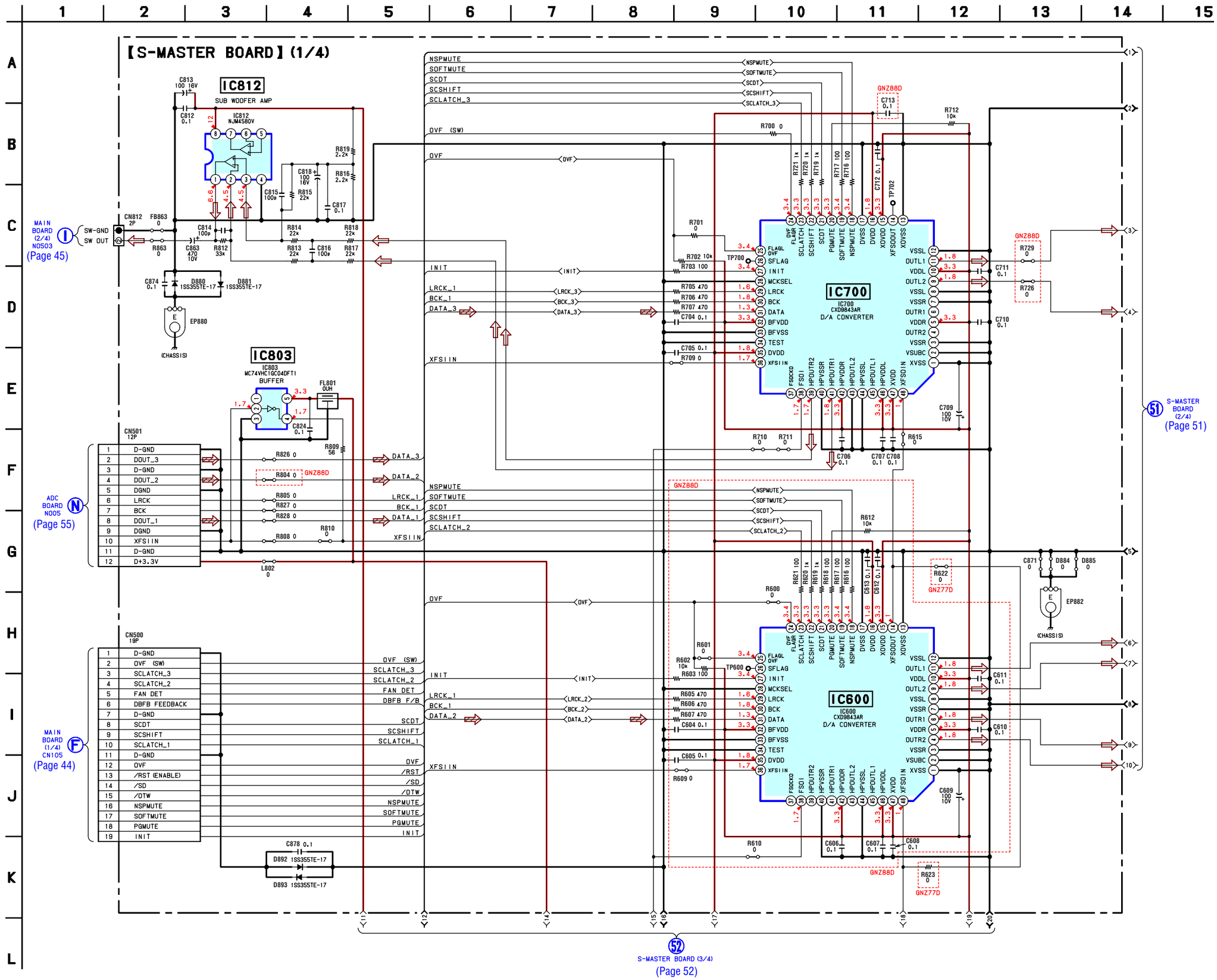
• **Semiconductor Location**

Ref. No.	Location
D532	E-4
D534	E-4
D552	E-2
D554	E-3
(D651)	E-7
(D652)	F-7
(D653)	F-7
(D654)	E-7
D730	E-11
D732	E-10
(D820)	C-2
(D880)	H-12
(D881)	H-12
(D882)	H-1
(D883)	H-1
D892	H-6
D893	H-6
IC500	G-3
IC530	F-4
IC550	F-3
IC600	G-7
IC630	F-7
IC700	G-10
IC730	F-10
IC800	G-3
IC803	G-9
(IC810)	G-12
IC812	H-12
IC880	H-2
(Q840)	B-8
Q850	B-5
Q851	B-5
Q855	B-5
Q856	B-5
Q860	B-6
Q861	B-6
Q865	B-5
Q866	B-5
Q870	B-9
Q871	B-9

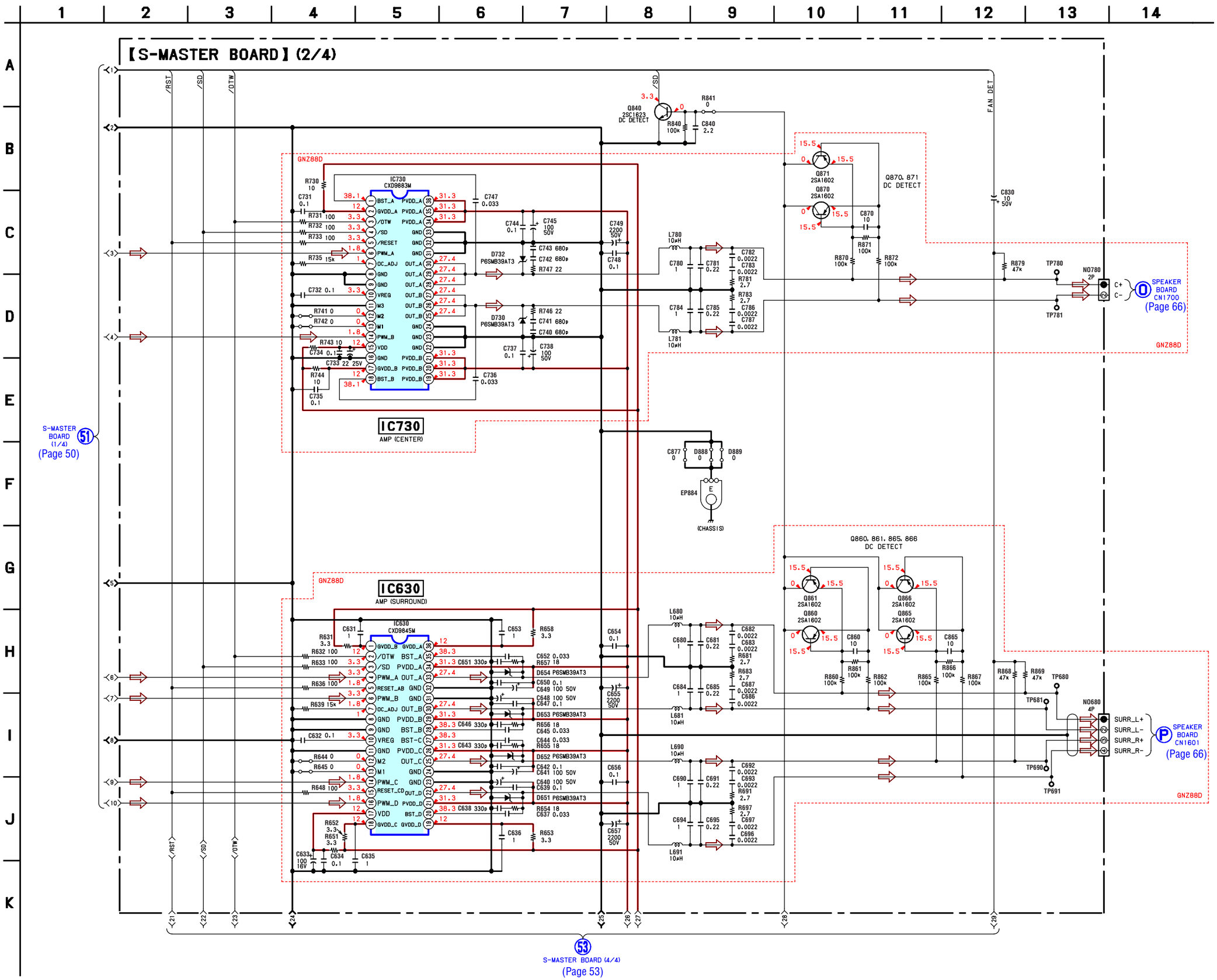
( ): SIDE B


1 2 3 4 5 6 7 8 9 10 11 12
A B C D E F G H I
【S-MASTER BOARD (SIDE B)】
(Page 65)
SPEAKER BOARD CN1500
R
(Page 65)
SPEAKER BOARD CN1601
P
(Page 65)
SPEAKER BOARD CN1700
O
(CHASSIS)
EP885
EP884
EP886
EP882
EP881
EP880
GNZ88D
NO580
NO680
NO780
S POWER BOARD CN1101 (GNZ88D) (Page 67) POWER UNIT (GNZ77D)
Q MIC BOARD NO1404 (Page 59)
F MAIN BOARD CN105 (Page 43)
N ADC BOARD NO05 (Page 54)
I MAIN BOARD NO503 (Page 43)
1-868-833-11
(11)

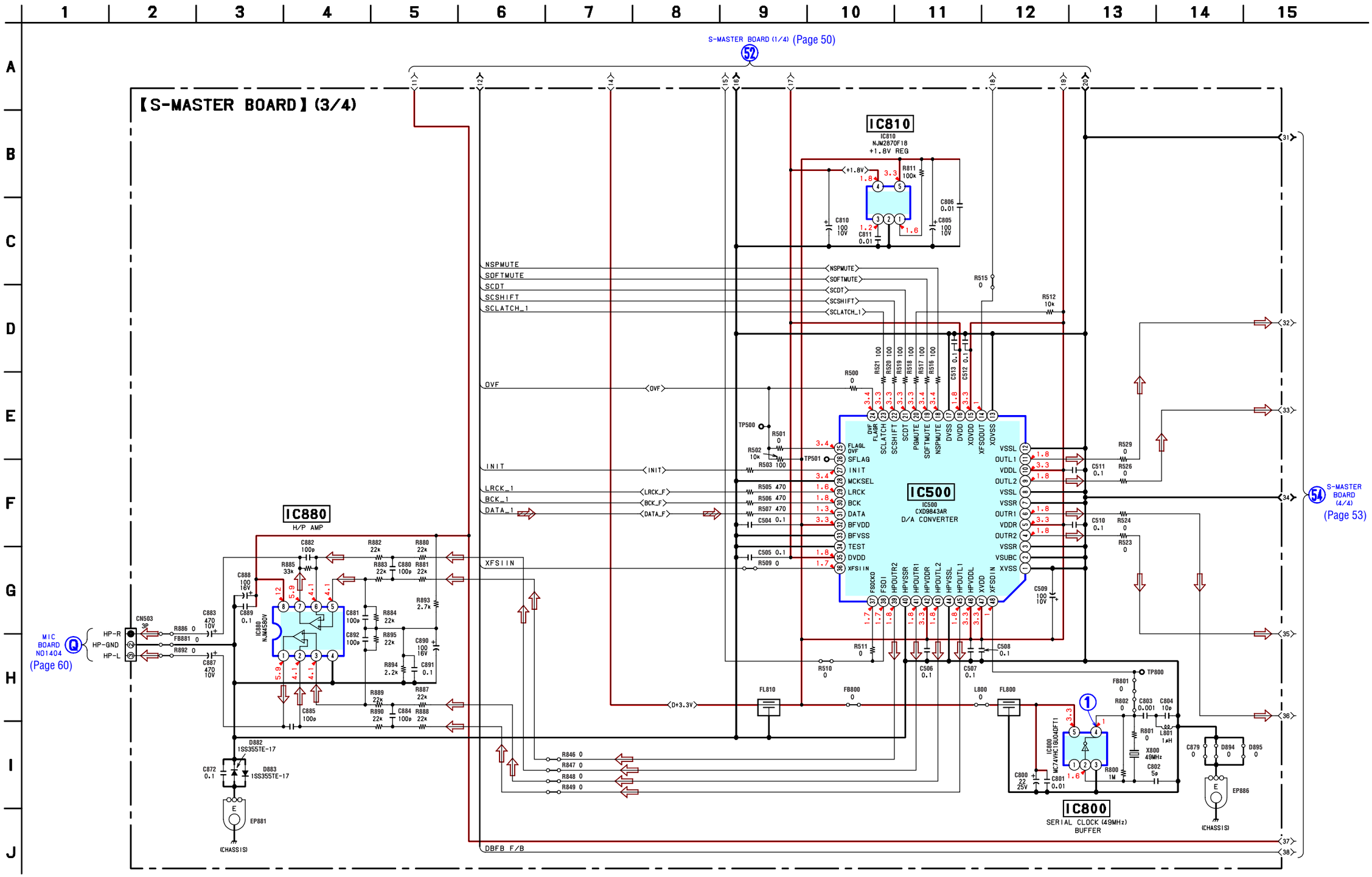
6-21. SCHEMATIC DIAGRAM — S-MASTER SECTION (1/4) —



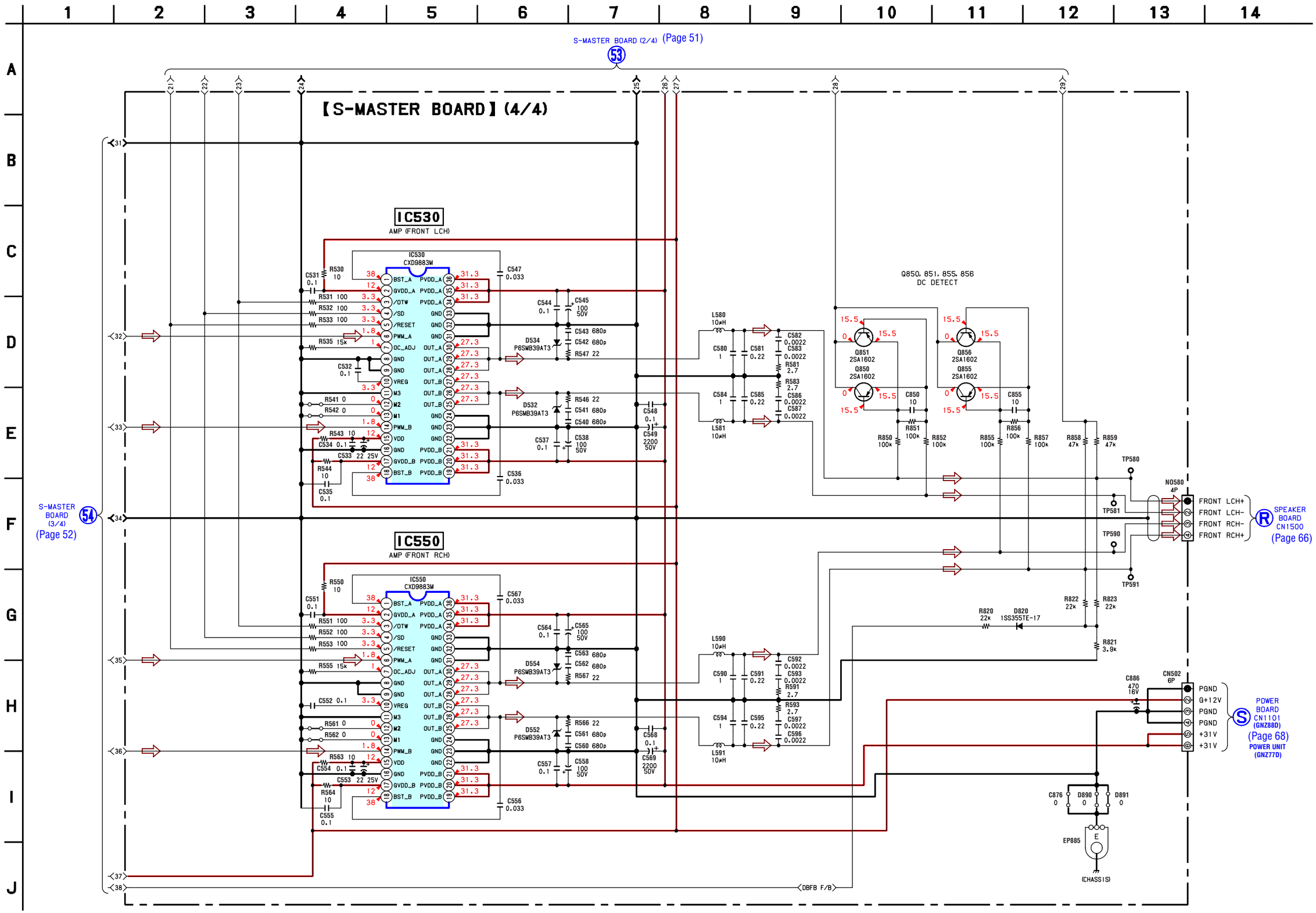
6-22. SCHEMATIC DIAGRAM — S-MASTER SECTION (2/4) —



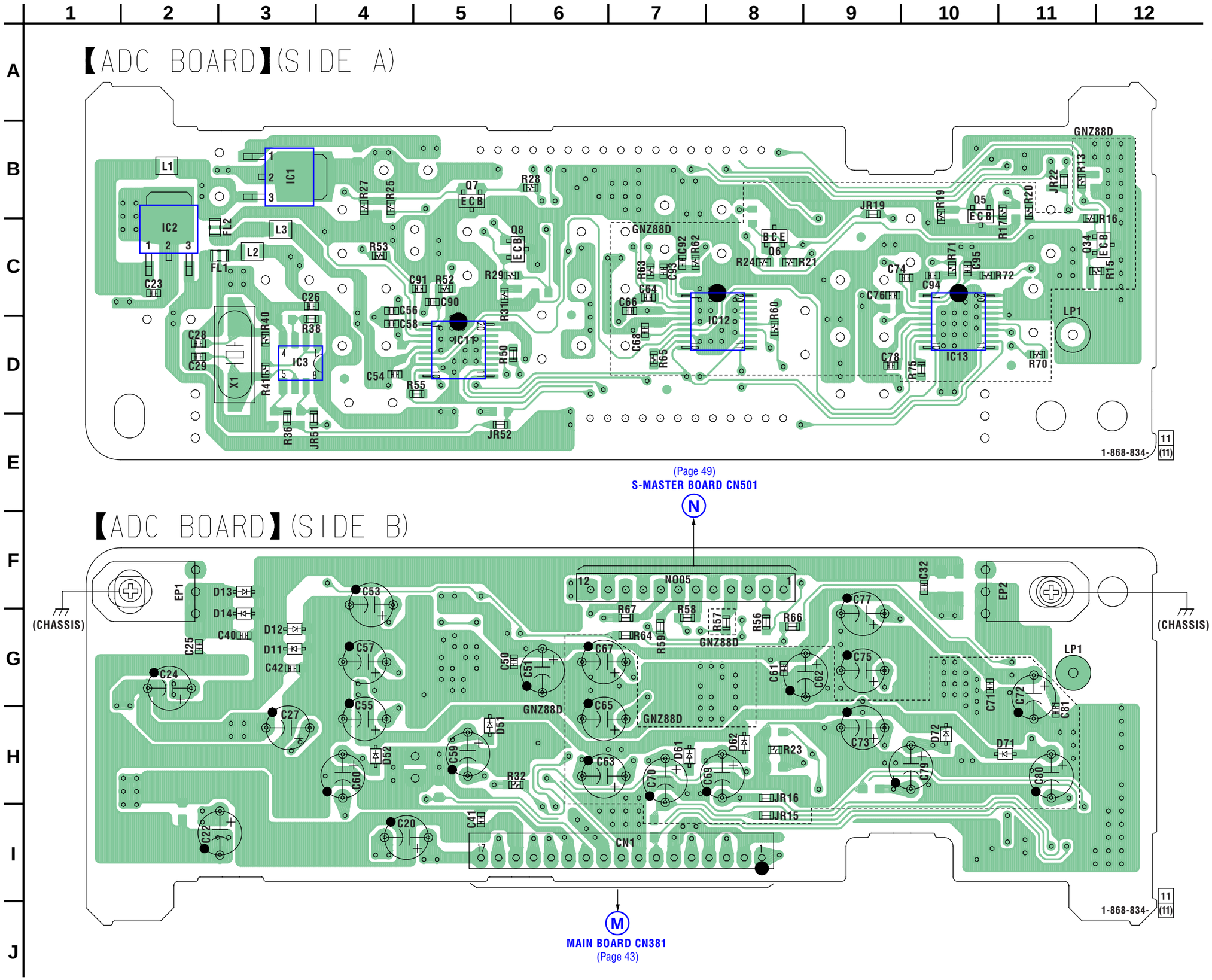
6-23. SCHEMATIC DIAGRAM — S-MASTER SECTION (3/4) — • Refer to page 33 for Waveforms.



6-24. SCHEMATIC DIAGRAM — S-MASTER SECTION (4/4) —



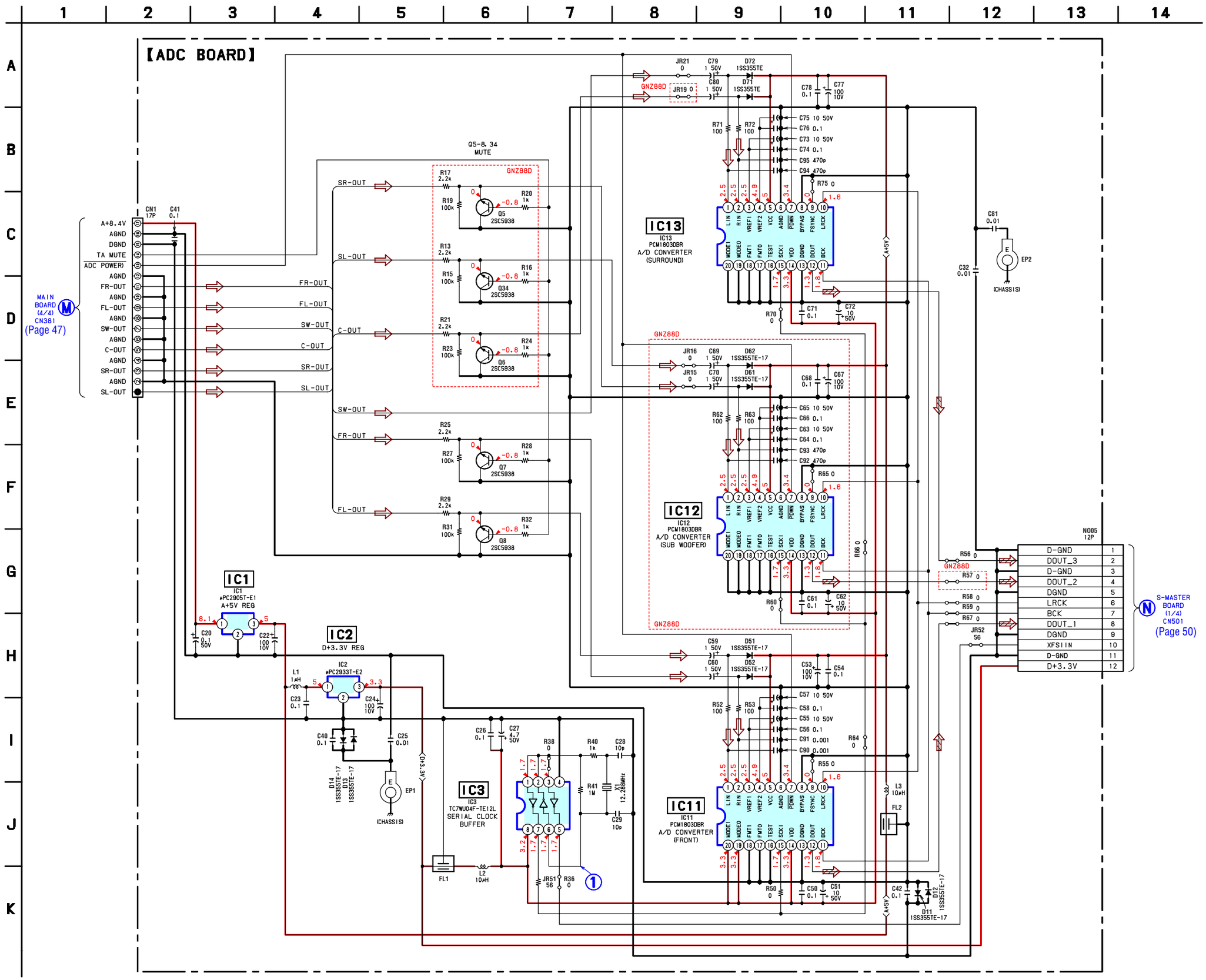
6-25. PRINTED WIRING BOARD — ADC SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



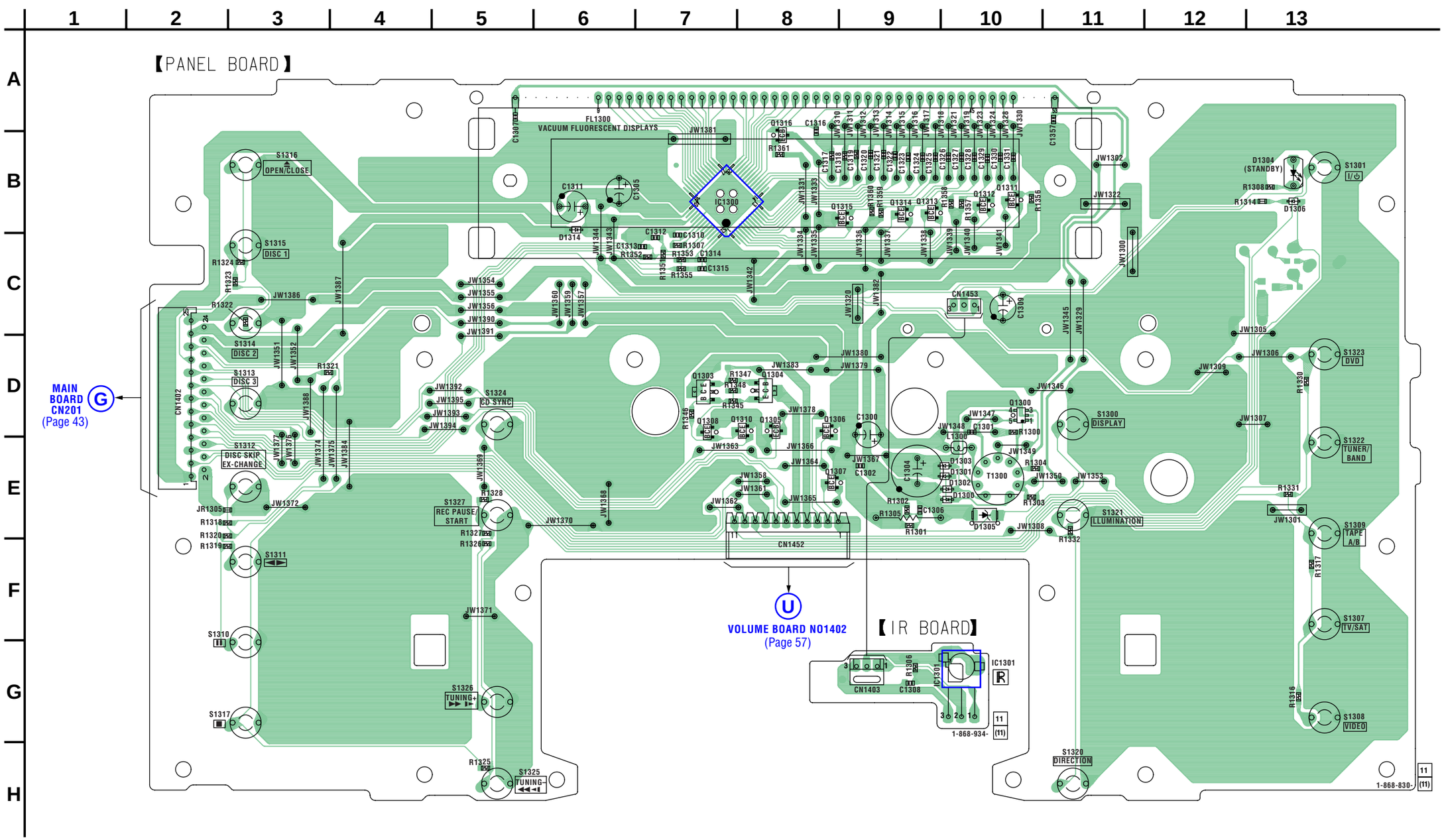
- **Semiconductor Location**

Ref. No.	Location
D11	G-3
D12	G-3
D13	F-3
D14	G-3
D51	H-5
D52	H-4
D61	H-7
D62	H-8
D71	H-11
D72	H-10
IC1	B-3
IC2	C-2
IC3	D-3
IC11	D-5
IC12	D-8
IC13	D-10
Q5	B-10
Q6	C-8
Q7	B-5
Q8	C-6
Q34	C-12

6-26. SCHEMATIC DIAGRAM — ADC SECTION — • Refer to page 33 for Waveforms.



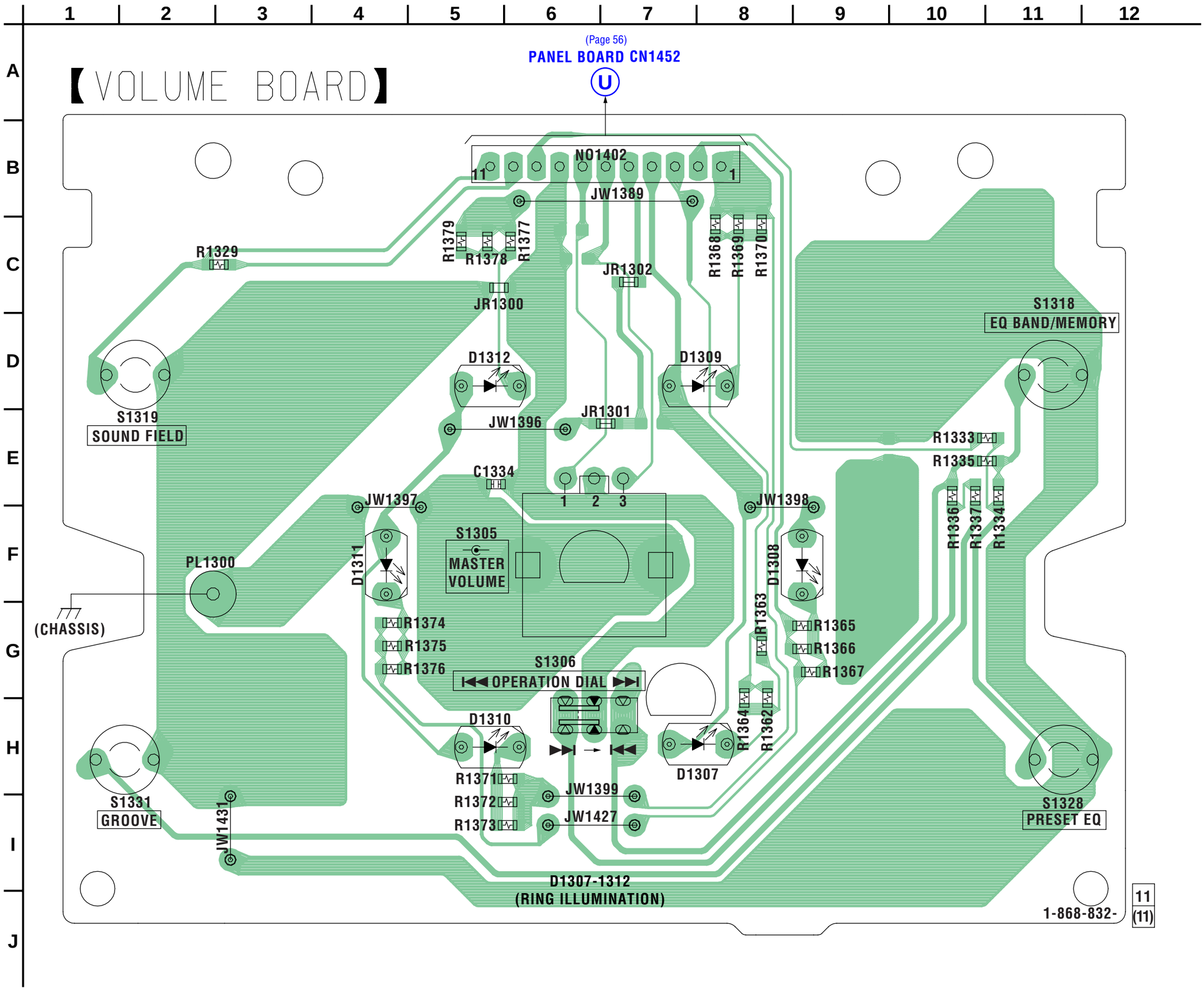
6-27. PRINTED WIRING BOARDS — PANEL SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D1300	E-10	Q1303	D-7
D1301	E-10	Q1304	D-8
D1302	E-10	Q1305	D-8
D1303	E-10	Q1306	D-8
D1304	B-13	Q1307	E-8
D1305	E-10	Q1308	D-7
D1306	B-13	Q1310	D-8
D1314	B-6	Q1311	B-10
		Q1312	B-10
IC1300	B-7	Q1313	B-9
IC1301	G-10	Q1314	B-9
		Q1315	B-9
Q1300	D-10	Q1316	A-8

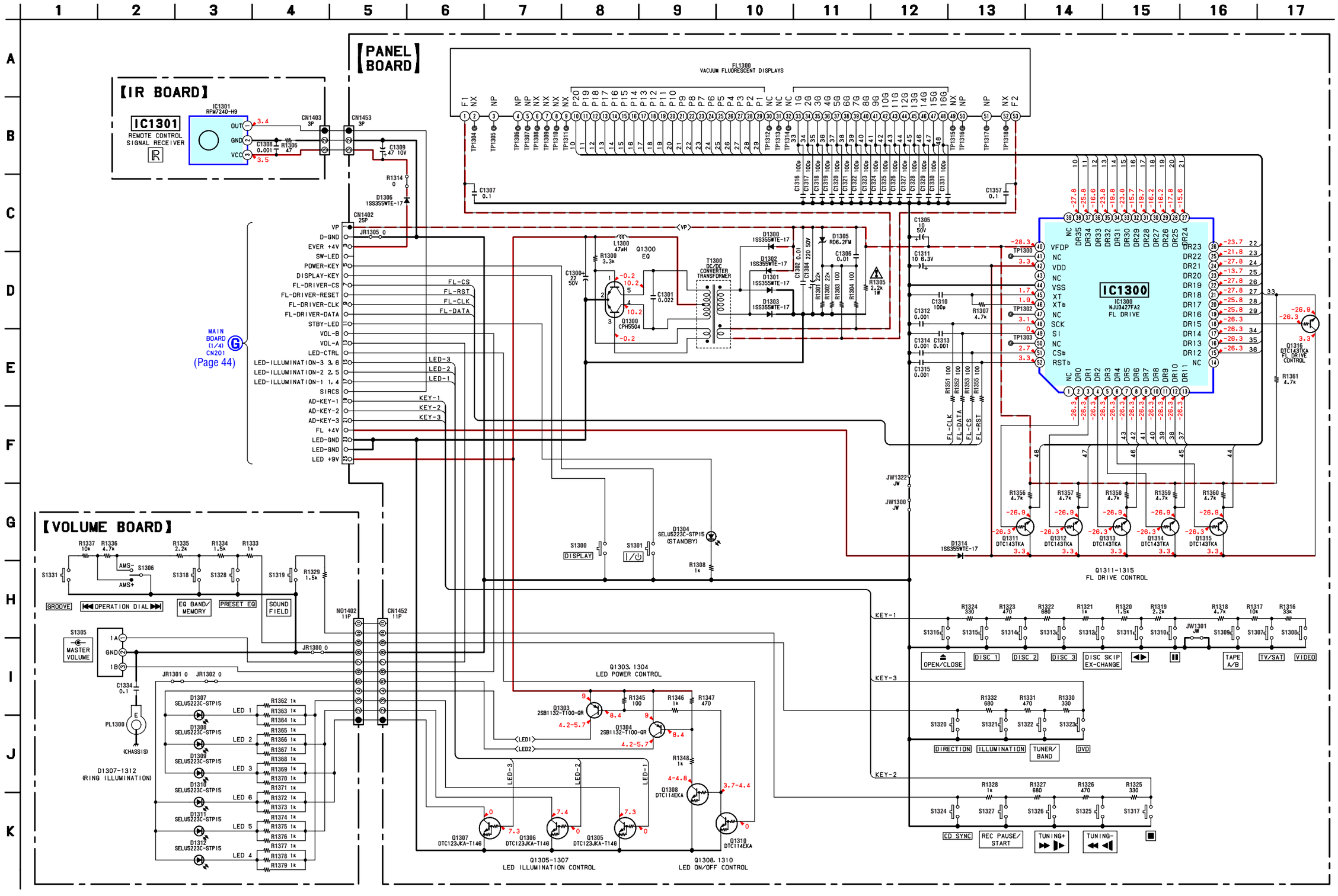
6-28. PRINTED WIRING BOARD — VOLUME SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



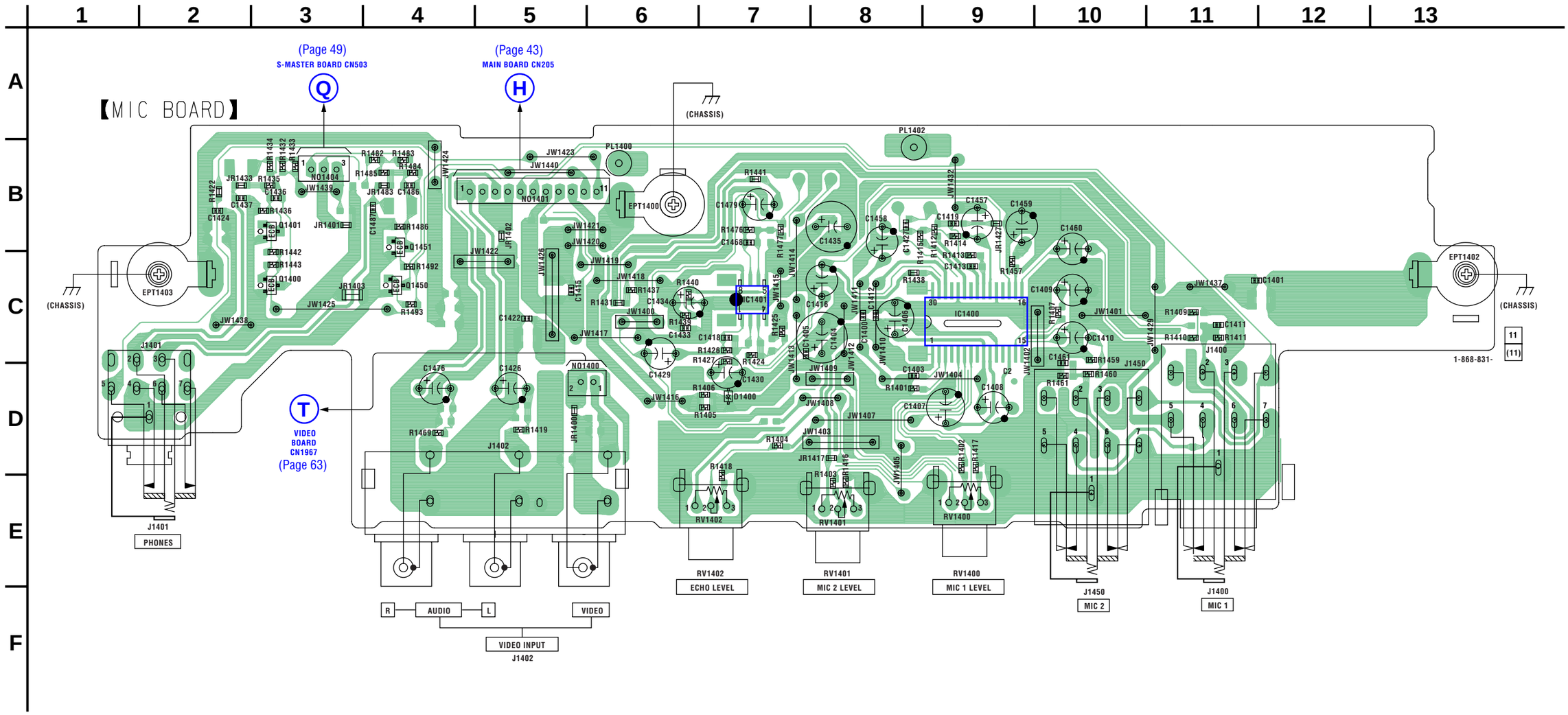
• **Semiconductor Location**

Ref. No.	Location
D1307	H-7
D1308	F-8
D1309	D-7
D1310	H-5
D1311	F-4
D1312	D-5

6-29. SCHEMATIC DIAGRAM — PANEL SECTION —



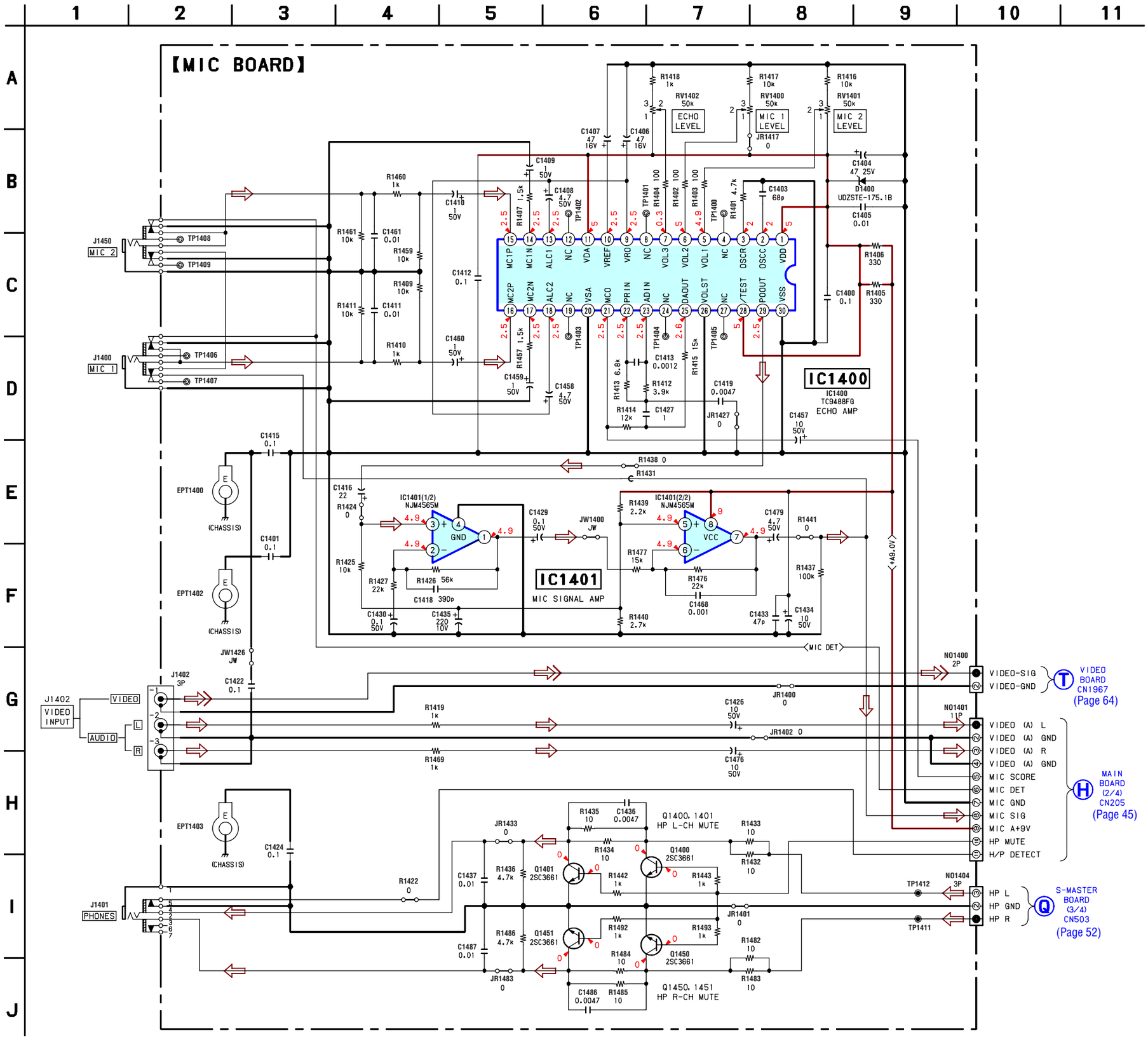
6-30. PRINTED WIRING BOARD — MIC SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



- **Semiconductor Location**

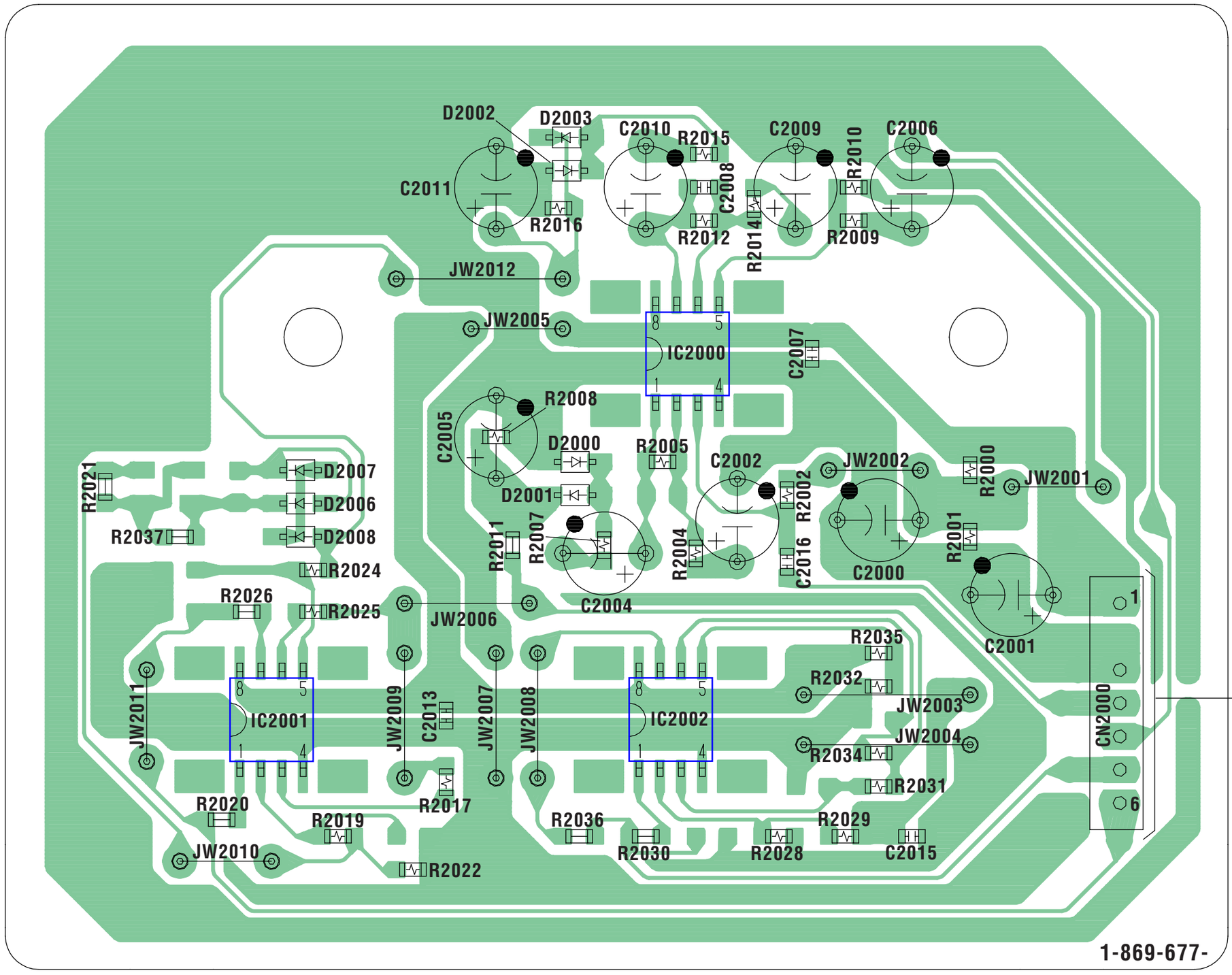
Ref. No.	Location
D1400	D-7
IC1400	C-9
IC1401	C-7
Q1400	C-3
Q1401	B-3
Q1450	C-4
Q1451	B-4

6-31. SCHEMATIC DIAGRAM — MIC SECTION —



6-32. PRINTED WIRING BOARD — KARAOKE SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.

【KARAOKE BOARD】

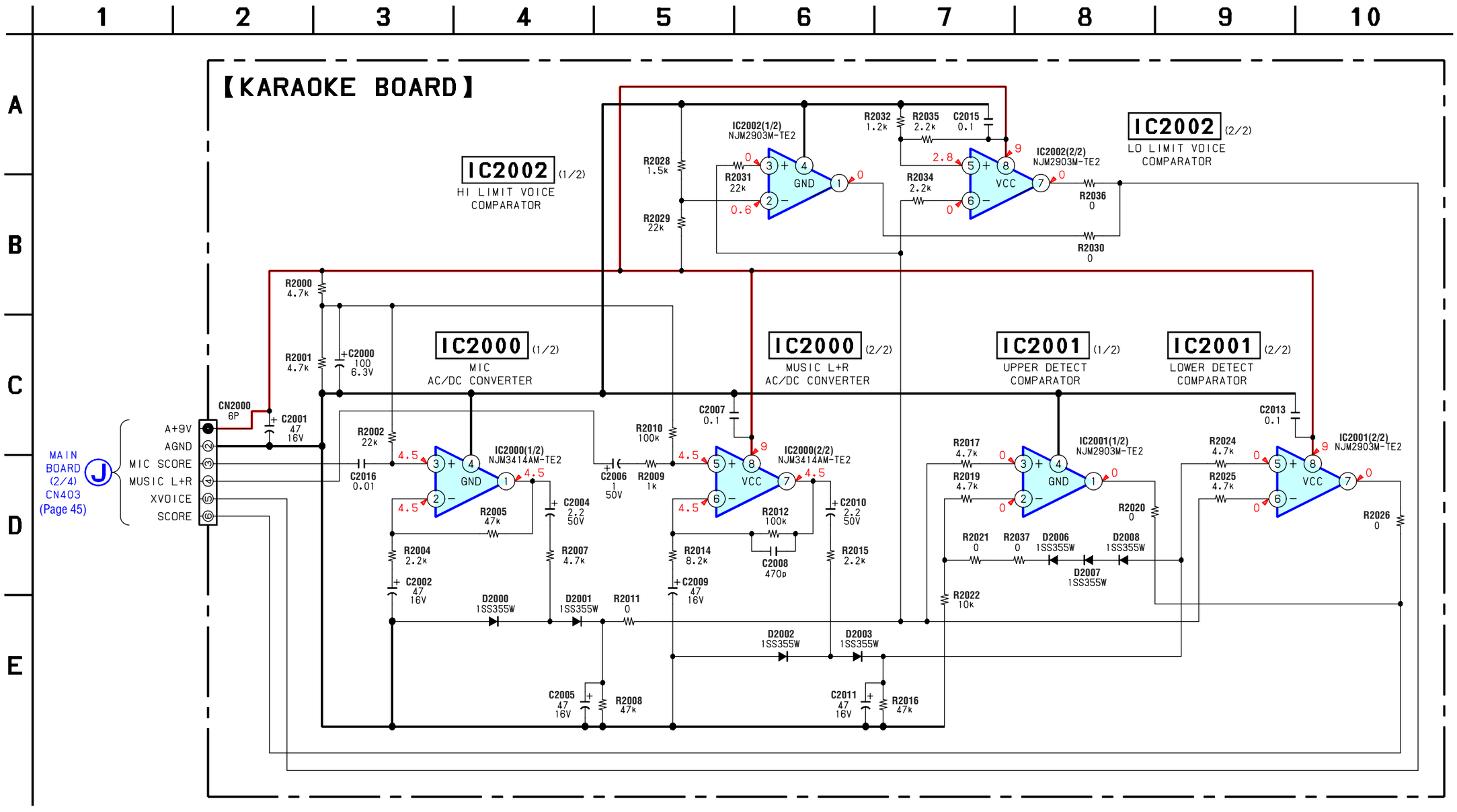


J MAIN BOARD CN403 (Page 43)

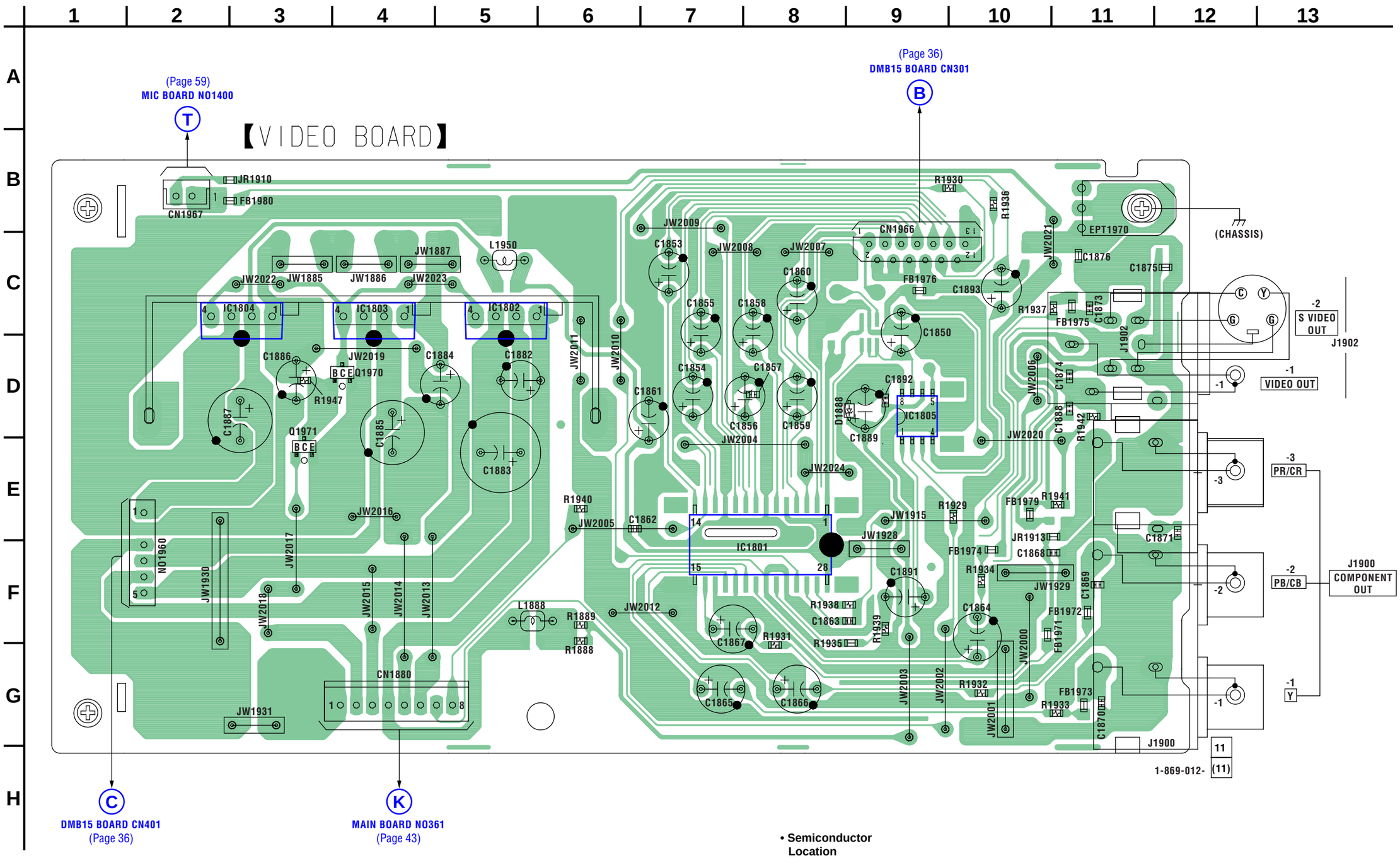
• **Semiconductor Location**

Ref. No.	Location
D2000	E-6
D2001	F-6
D2002	C-6
D2003	C-6
D2006	F-4
D2007	F-4
D2008	F-4
IC2000	E-7
IC2001	H-3
IC2002	H-7

6-33. SCHEMATIC DIAGRAM — KARAOKE SECTION —



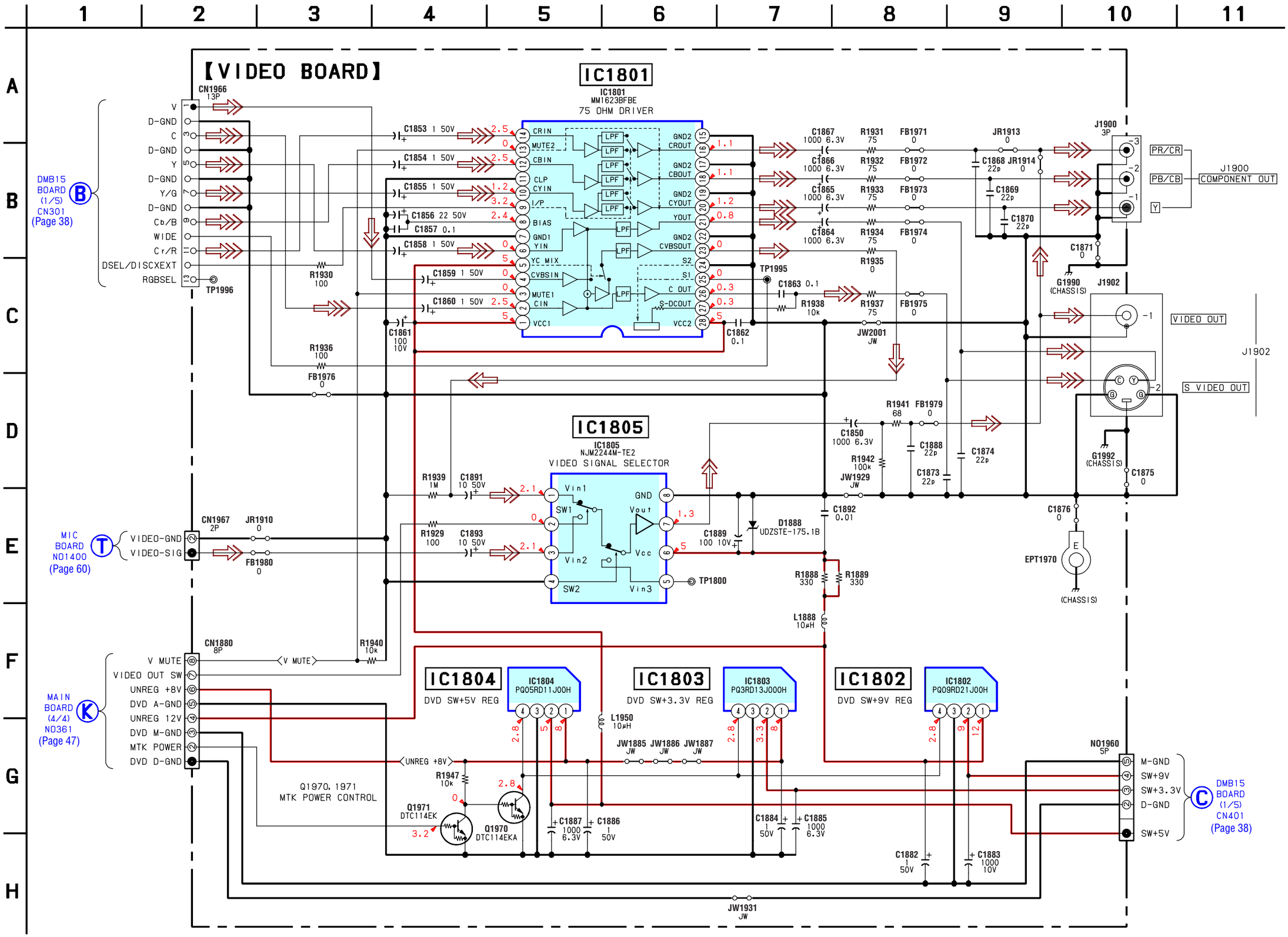
6-34. PRINTED WIRING BOARD — VIDEO SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



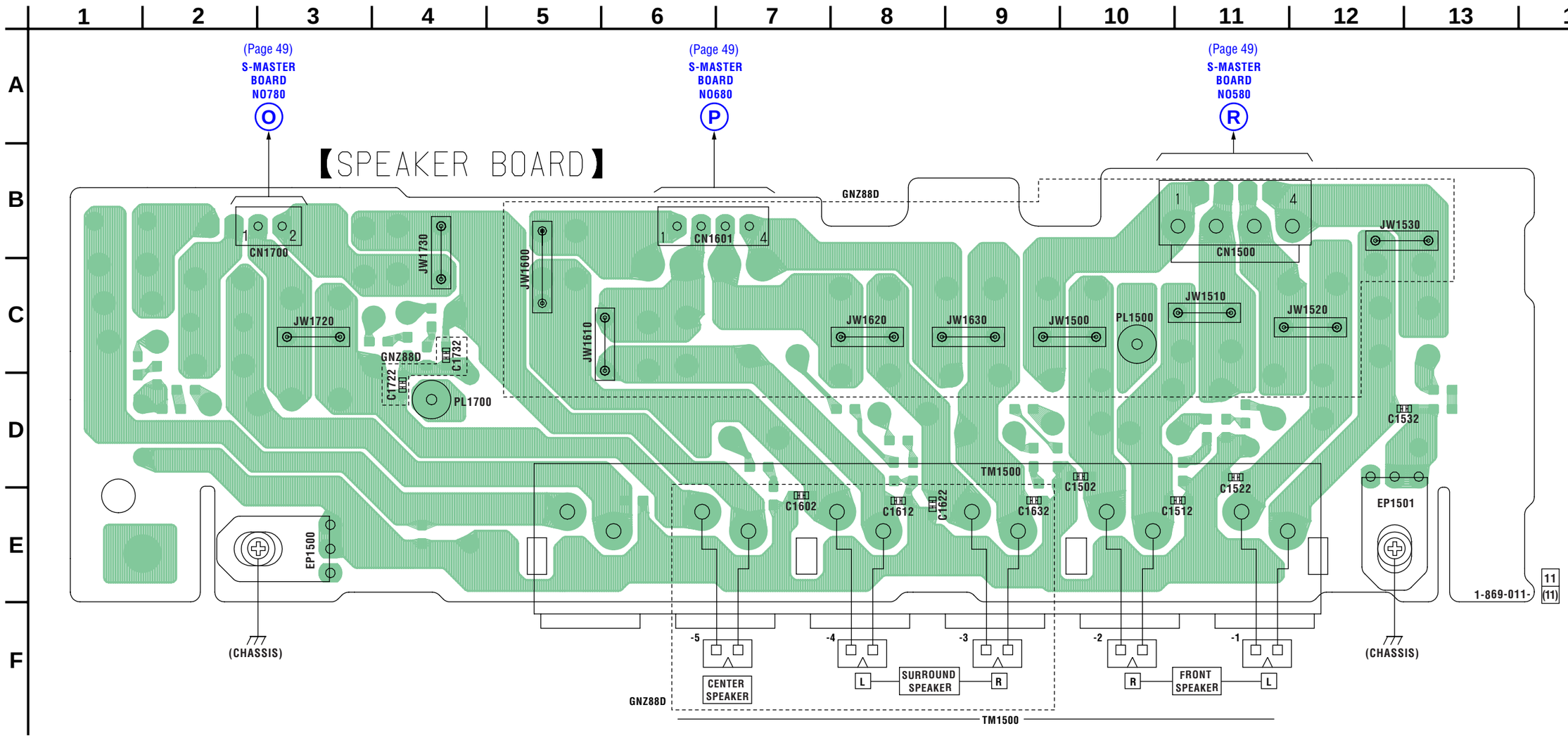
• **Semiconductor Location**

Ref. No.	Location
D1888	D-9
IC1801	F-8
IC1802	C-5
IC1803	C-4
IC1804	C-3
IC1805	D-9
Q1970	D-4
Q1971	E-3

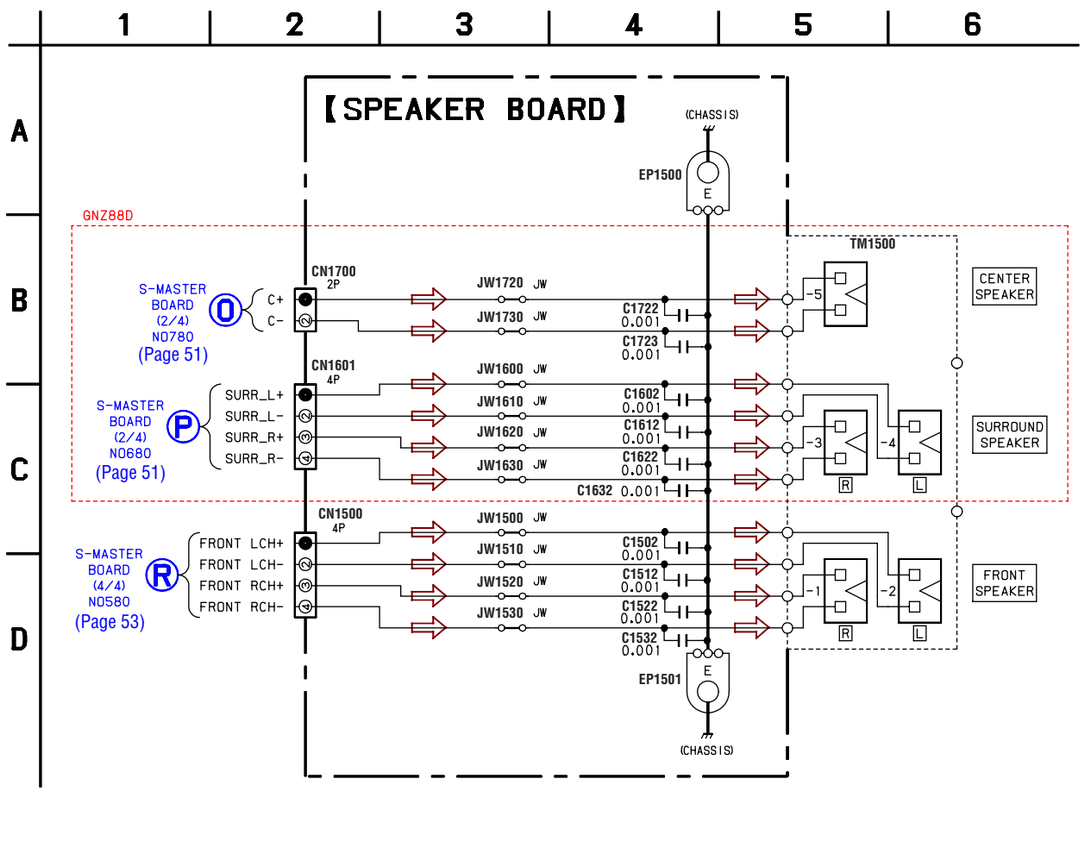
6-35. SCHEMATIC DIAGRAM — VIDEO SECTION —



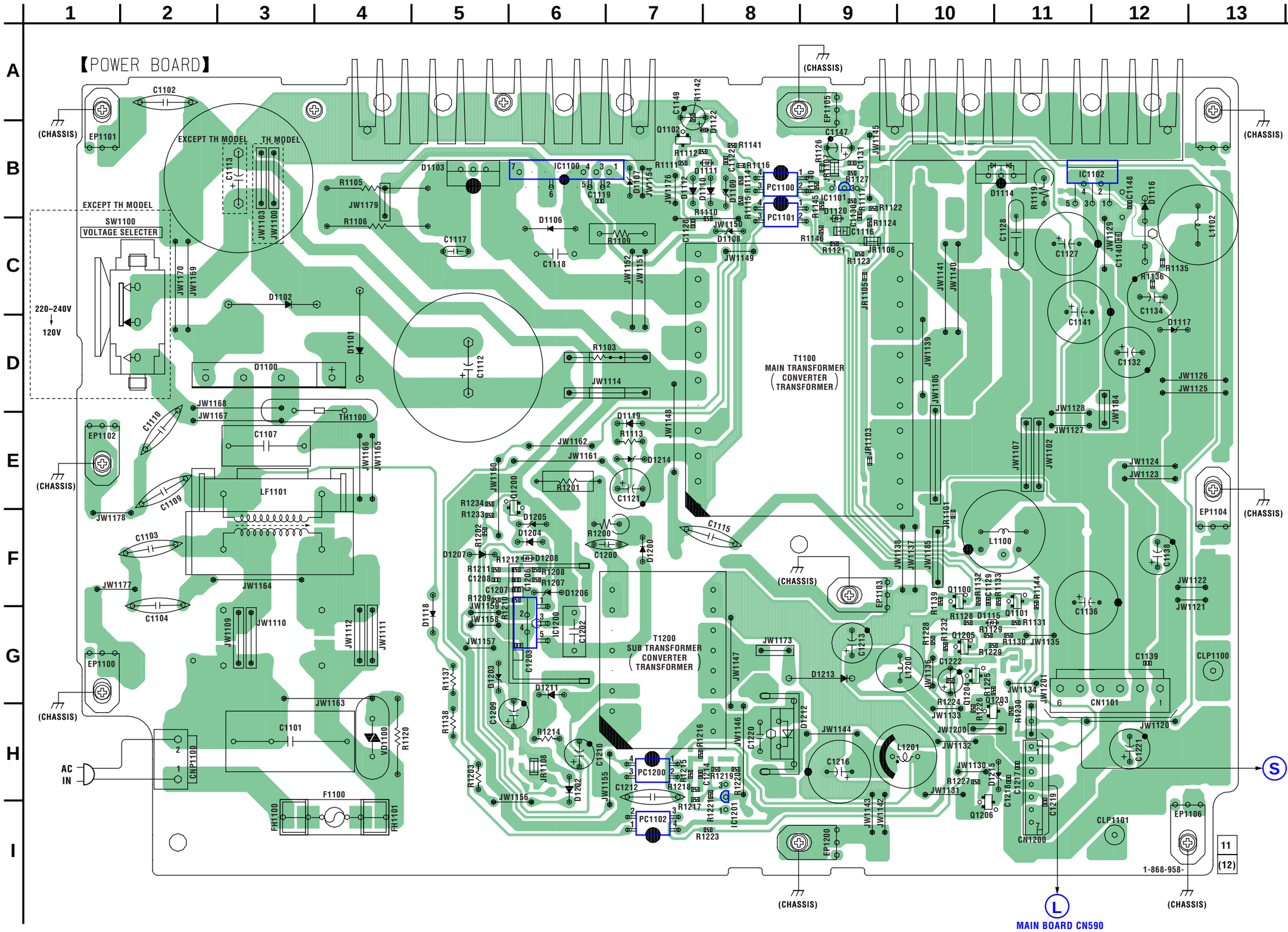
6-36. PRINTED WIRING BOARD — SPEAKER SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



6-37. SCHEMATIC DIAGRAM — SPEAKER SECTION —



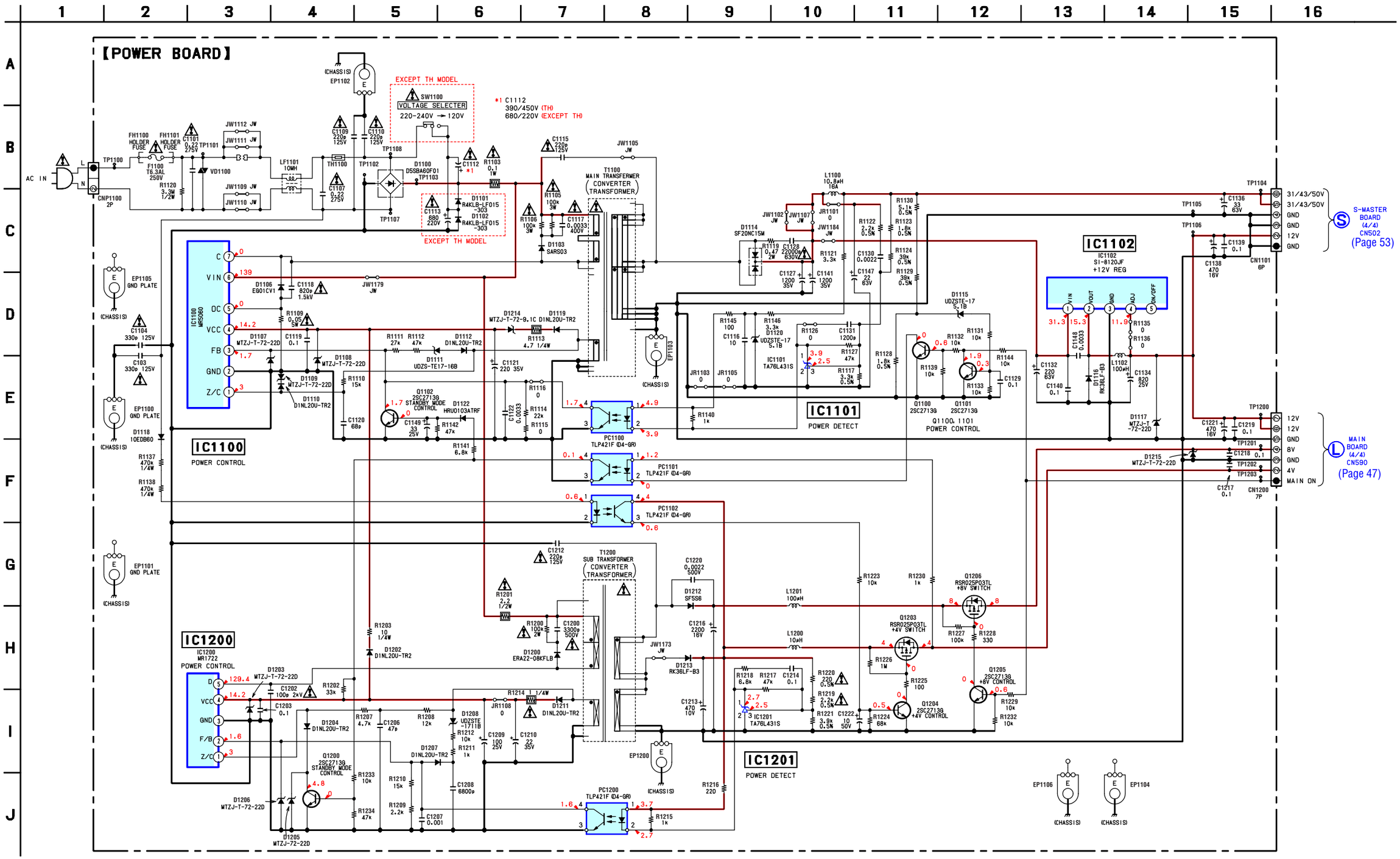
6-38. PRINTED WIRING BOARD — POWER SECTION (HCD-GNZ88D) — • Refer to page 32 for Circuit Boards Location. **: Uses unleaded solder.**



- **Semiconductor Location**

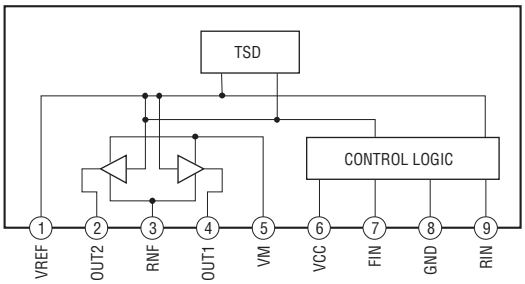
Ref. No.	Location
D1100	D-3
D1101	D-4
D1102	C-3
D1103	B-5
D1106	C-6
D1107	B-7
D1108	C-8
D1109	B-8
D1110	B-8
D1111	B-8
D1112	B-7
D1114	B-11
D1115	G-10
D1116	B-12
D1117	D-12
D1118	G-5
D1119	E-7
D1120	B-9
D1122	B-8
D1200	F-7
D1202	H-6
D1203	G-5
D1204	F-6
D1205	F-6
D1206	F-6
D1207	F-5
D1208	F-6
D1211	G-6
D1212	H-8
D1213	G-9
D1214	E-7
D1215	H-11
IC1100	B-6
IC1101	B-9
IC1102	B-11
IC1200	G-6
IC1201	I-8
PC1100	B-8
PC1101	B-8
PC1102	I-7
PC1200	H-7
Q1100	F-10
Q1101	G-11
Q1102	B-7
Q1200	E-6
Q1203	H-10
Q1204	G-10
Q1205	G-10
Q1206	I-10

6-39. SCHEMATIC DIAGRAM — POWER SECTION (HCD-GNZ88D) —

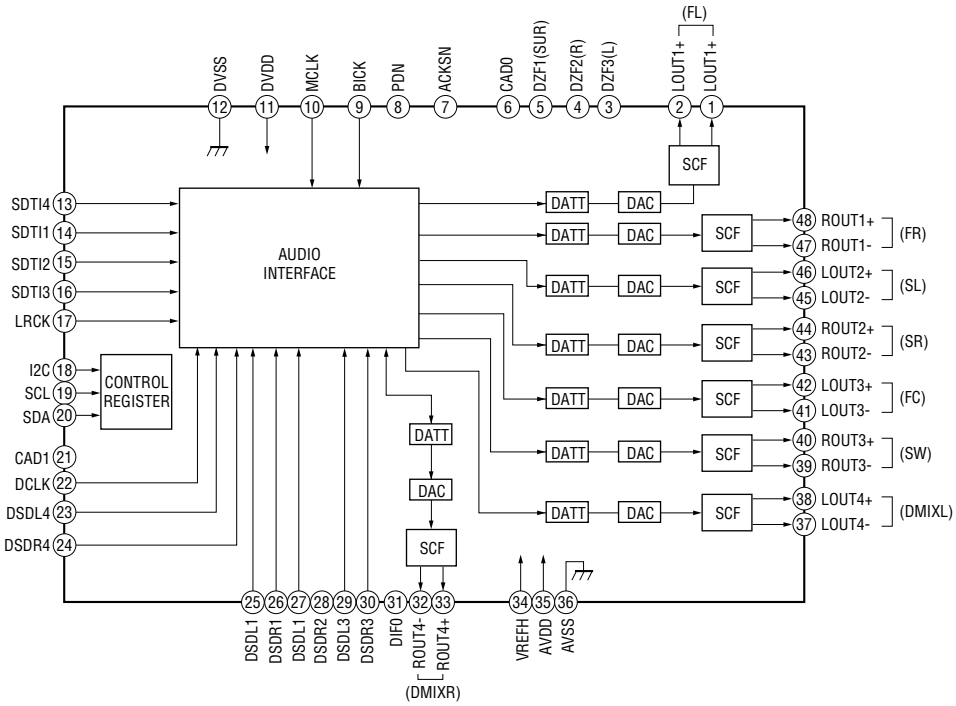


• IC Block Diagrams

IC701 BA6956AN (DRIVER Board)
IC712 BA6956AN (DRIVER Board)



IC301 AK4358VQ-L (DMB15 Board)



• IC Pin Descriptions

IC102 CXD9849R (CD/DVD RF AMP, FOCUS/TRACKING ERROR AMP, DVD SYSTEM PROCESSOR, DIGITAL SERVO PROCESSOR) (DMB15 BOARD (3/5))

Pin No.	Pin Name	I/O	Pin Description
1	AGND	—	Ground pin
2	DVDA	I	AC coupled input path A
3	DVDB	I	AC coupled input path B
4	DVDC	I	AC coupled input path C
5	DVDD	I	AC coupled input path D
6	DVDRFIP	I	AC coupled DVD RF signal input RFIP
7	DVDRFIN	I	AC coupled DVD RF signal input RFIN Not used in this set. (Open)
8	NA	I	DC coupled main-beam RF signal input A
9	NB	I	DC coupled main-beam RF signal input B
10	MC	I	DC coupled main-beam RF signal input C
11	MD	I	DC coupled main-beam RF signal input D
12	SA	I	DC coupled sub-beam RF signal input A Not used in this set. (Open)
13	SB	I	DC coupled sub-beam RF signal input B Not used in this set. (Open)
14	SC	I	DC coupled sub-beam RF signal input C Not used in this set. (Open)
15	SD	I	DC coupled sub-beam RF signal input D Not used in this set. (Open)
16	CDFON	I	CD focusing error negative input Not used in this set. (Open)
17	CDFOP	I	CD focusing error positive input Not used in this set. (Open)
18	TNI	I	3 beam satellite PD signal negative input
19	TPI	I	3 beam satellite PD signal positive input
20	MDI1	I	Laser power PD monitor signal input
21	MDI2	I	Laser power PD monitor signal input
22	LDO2	O	Laser drive signal output
23	LDO1	O	Laser drive signal output
24	SVDD3	—	Power Supply pin (+3.3 V)
25	CSD	O	Central servo, Positive main beam summing signal output Not used in this set. (Open)
26	RFLVL	O	RFRP low pass, or Positive main beam summing signal output Not used in this set. (Open)
27	SGND	—	Ground pin
28	V2REFO	O	Reference voltage 2.8 V
29	V2O	O	Reference voltage 2.0 V
30	VREFO	O	Reference voltage 1.4 V
31	FEO	O	Focus error monitor signal output Not used in this set. (Open)
32	TEO	O	Tracking error monitor signal output Not used in this set. (Open)
33	TEZISLY	O	TE Slicing Level Not used in this set.
34	OPOUT	O	Op amp output Not used in this set. (Open)
35	OPIN	I	Op amp negative input Not used in this set. (Open)
36	OPIN	I	Op amp positive input Not used in this set. (Open)
37	DMO	O	Disk motor control signal output. PWM signal output
38	FMO	O	Feed motor signal control. PWM signal output
39	TROPENPWM	O	Tray PWM output/Tray open signal output.
40	IOPMON	I	General PWM signal input
41	TRO	O	Tracking servo signal output
42	FOO	O	Focus servo signal output
43	DVSS	—	Ground pin
44	NC	—	Not used. (Open)
45	NC	—	Not used. (Open)
46	DVDD3	—	Power Supply pin (+3.3 V)
47	SPFG	I	Motor Hall sensor signal input
48	DSEL	O	Select signal output

Pin No.	Pin Name	I/O	Pin Description
49	WIDE	I	Wide signal output
50	MSW	O	Volume control signal output
51	MAMUTE	O	MAMUTE signal output to System Controller Not used in this set. (Open)
52	DVDD18	—	Power Supply pin (+1.8 V)
53 to 58	IOA 2 to 7	O	Address bus 2 to 7 output to PROM
59	HIGHA0	O	Address bus 8 output to PROM
60, 61	IOA18, 19	O	Address bus 18, 19 output to PROM
62	DVSS	—	Ground pin
63	APLLCAP	I	APLL External Capacitance connection
64	APLLVSS	—	Ground pin
65	VDD3	—	Power Supply pin (+3.3 V)
66	IOWA	O	WE signal output to PROM
67	A16	O	Address bus 16 output to PROM
68 to 72	HIGHA 7 to 3	O	Address bus 15 to 11 output to PROM
73	DVDD3	—	Power Supply pin (+3.3 V)
74, 75	HIGHA 2, 1	O	Address bus 10, 9 output to PROM
76	IOA20	O	Address bus 20 output to PROM
77	IOCS	O	CE signal output to PROM
78	IOA1	O	Address bus 1 output to PROM
79	IOOE	O	OE signal output to PROM
80	DVDD3	—	Power Supply pin (+3.3 V)
81 to 84	AD 0 to 3	I	Data bus 0 to 3 input from PROM
85	DVSS	—	Ground pin
86 to 88	AD 4 to 6	I	Data bus 4 to 6 input from PROM
89	IOA21	O	Address bus 21 output to PROM
90	ALE	O	Address latch enable Not used in this set. (Open)
91	AD7	I	Data bus 7 input from PROM
92	A17	O	Address bus 17 output to PROM
93	IOA0	O	Address bus 0 output to PROM
94	DVSS	—	Ground pin
95	UWA	I	System Controller write strobe Not used in this set. (Open)
96	URB	I	System Controller read strobe Not used in this set. (Open)
97	DVDD18	—	Power Supply pin (+1.8 V)
98	IFSDO	I	DVD SOD signal input from System Controller
99	IFCK	O	DVD SCO signal output to System Controller
100	XIFCS	I	DVD XIFCS signal input from System Controller
101	IFSDI	I	VIFBUSY signal output from System Controller
102	SCL	O	SCL signal output to EEPROM
103	SDA	O	SDA signal output to EEPROM
104	TRG-SW	O	RS232 RXD signal output Not used in this set. (Open)
105	IFBSY	I	RS232 TXD signal input from System Controller
106	RXD	I	RD232 RXD clock
107	TXD	I	RD232 TXD data
108	DVDD3	—	Power Supply pin (+3.3 V)
109	ICE	I	ICE mode enable Not used in this set. (Open)
110	PRST	I	MTRST signal input from System Controller
111	IR	I	IR control signal input Not used in this set. (Open)
112	INT0	I	External interrupt0 Not used in this set. (Open)
113	DQMO	O	DQM0 signal output to SD-RAM
114	MREQ	I	DQM signal input
115	RD7	I	Data bus 7 from SD-RAM
116	DVSS	—	Ground pin
117, 118	RD 6, 5	I	Data bus 6, 5 from SD-RAM

Pin No.	Pin Name	I/O	Pin Description
119	DVSS	—	Ground pin
120, 121	RD 4, 3	I	Data bus 4, 3 from SD-RAM
122	DVDD18	—	Power Supply pin (+1.8 V)
123 to 125	RD 2 to 0	I	Data bus 2 to 0 from SD-RAM
126	RD15	I	Data bus 15 from SD-RAM
127	DVDD3	—	Power Supply pin (+3.3 V)
128	RD 14	I	Data bus 14 from SD-RAM
129 to 133	RD 13 to 9	I	Data bus 13 to 9 from SD-RAM
134	DVSS	—	Ground pin
135	RD8	I	Data bus 8 from SD-RAM
136	GPI0	—	Not used in this set. (Open)
137	DQM1	O	DQM1 signal output to SD-RAM
138	REW	O	WE signal output to SD-RAM
139	CAS	O	CAS signal output to SD-RAM
140	RAS	O	RAS signal output to SD-RAM
141	DVDD3	—	Power Supply pin (+3.3 V)
142	RCS	O	RCS signal output to SD-RAM
143	BAO	O	BAO signal output to SD-RAM
144	DVSS	—	Ground pin
145	BA1	O	BA1 signal output to SD-RAM
146	RA10	O	Address bus 10 output to SD-RAM
147	RA0	O	Address bus 0 output to SD-RAM
148	DVSS	—	Ground pin
149 to 151	RA 1 to 3	O	Address bus 1 to 3 output to SD-RAM
152	DVDD18	—	Power Supply pin (+1.8 V)
153	NC	—	Not used. (Open)
154	NC	—	Not used. (Open)
155	DVDD3	—	Power Supply pin (+3.3 V)
156	RCLK	O	CLK signal output to SD-RAM
157	CKE	O	CKE signal output to SD-RAM
158 to 160	RA 11 to 8	O	Address bus 11 to 8 output to SD-RAM
161	DVSS	—	Ground pin
162	RA7	O	Address bus 7 output to SD-RAM
163	DVSS	—	Ground pin
164 to 166	RA 6 to 4	O	Address bus 6 to 4 output to SD-RAM
167	DVDD3	—	Power Supply pin (+3.3 V)
168	DISC/X	—	Not used in this set. (Open)
169	RGB	O	RGB control signal output Not used in this set. (Open)
170	TSD M	O	TSDM signal output
171	NC	—	Not used in this set. (Open)
172	NC	—	Not used in this set. (Open)
173	DVDD18	—	Power Supply pin (+1.8 V)
174	FWD	—	Not used in this set. (Open)
175	NC	—	Not used. (Open)
176	LIMSW	O	LIMSW signal output to Optical pick-up
177	OCSW	I	SEN signal input from System Controller/OCSW signal input Not used. (Open)
178	REW	—	Not used in this set. (Open)
179	CKSW	I	CKSW signal input Not used in this set. (Open)
180	NC	—	Not used in this set. (Open)
181	NC	—	Not used in this set. (Open)
182	DVDD3	—	Power Supply pin (+3.3 V)
183	NC	—	Not used in this set. (Open)
184	NC	—	Not used in this set. (Open)

Pin No.	Pin Name	I/O	Pin Description
185	NC	—	Not used in this set. (Open)
186	NC	—	Not used in this set. (Open)
187	NC	—	Not used in this set. (Open)
188	NC	—	Not used in this set. (Open)
189	DAVCC	—	Power Supply pin (+3.3 V)
190	VREF	I	Bandgap reference voltage Not used in this set. (Open)
191	FS	O	Full scale adjustment (pull down)
192	YUV0	—	Not used in this set. (Open)
193	DAVSS	—	Ground pin
194	YUV1	O	Y signal output to VIDEO AMP
195	DAVDD	—	Power Supply pin (+3.3 V)
196	YUV2	O	CHROMA signal output to VIDEO AMP
197	DAVSS	—	Ground pin
198	YUV3	O	VIDEO signal output to VIDEO AMP
199	DAVDD	—	Power Supply pin (+3.3 V)
200	YUV4	O	G signal output to VIDEO AMP
201	DAVSS	—	Ground pin
202	YUV5	O	B signal output to VIDEO AMP
203	YUV6	O	R signal output to VIDEO AMP
204	DVDD3	—	Power Supply pin (+3.3 V)
205	MIC/VSYNC	I	Microphone status signal input
206	VOICE/YUV7	I	Karaoke voice signal input
207	KRMOB/HSYNC	O	Karaoke mode detection signal output
208	SMSCK	I	Karaoke score signal input
209	SPDATA/SMSDI	I	Audio data of SPDIF input
210	MUTE	O	Mute signal output
211	MUTE123	O	Mute signal output
212	DVDD3	—	Power Supply pin (+3.3 V)
213	ALRCK	I	Audio left/right channel clock signal input
214	ABCK	O	Audio bit clock signal output
215	ACLK	I	Audio DAC master clock signal input
216	DVSS	—	Ground pin
217	ASDATA0	O	Auio serial data signal output
218	ASDATA1	O	Auio serial data signal output
219	ASDATA2	O	Auio serial data signal output
220	XRST	O	Reset signal output
221	DVDD18	—	Power Supply pin (+1.8 V)
222	ASDATA4	O	Auio serial data signal output
223	DVSS	—	Ground pin
224	DWIDE	—	Not used in this set. (Open)
225	SDPIF	O	SPDIF signal output
226	RFGND18	—	Ground pin
227	RFVDD18	—	Power Supply pin (+1.8 V)
228	ZTALO	O	Oscillator signal output (27 MHz)
229	ZTALI	I	Oscillator signal input (27 MHz)
230	JITFO	O	RF jitter meter output
231	JITFN	I	Negative input of operation amplifier for RF jigger meter
232	PLLVSS	—	Ground pin
233	IDAC	—	Not Used.
234	PLLVDD3	—	Power Supply pin (+3.3 V)
235	LPFON	O	Negative output of loop filter amplifier
236	LPFIP	I	Positive input of loop filter amplifier
237	LPFIN	I	Negative input of loop filter amplifier

Pin No.	Pin Name	I/O	Pin Description
238	LPFOP	O	Positive output of loop filter amplifier
239	VDD3	I	Power Supply pin (+3.3 V)
240	NC	—	Not used. (Open)
241	VSS	—	Ground pin
242	NC	—	Not used. (Open)
243	NC	—	Not used. (Open)
244	RFVDD3	—	Power Supply pin (+3.3 V)
245	RFRPDC	I	RFRP signal input
246	RFRPAC	I	RFRP signal input
247	HRFZC	I	High frequency RF ripple zero crossing
248	CRTPLP	O	Defect level filter capacitor connecting
249	RFGND	—	Ground pin
250	NC	—	Not used. (Open)
251	NC	—	Not used. (Open)
252	OSP	O	RF offset cancellation capacitor connecting
253	OSN	I	RF offset cancellation capacitor connecting
254	RFGC	O	RF offset loop capacitor connecting for DVD-ROM
255	IREF	I	Current reference input
256	AVDD3	—	Power Supply pin (+3.3 V)

IC401 M30622MEP-A50FPU0 (SYSTEM CONTROL) (MAIN BOARD (1/4))

Pin No.	Pin Name	I/O	Pin Description
1	SW CHANNEL SELECT	O	Signal path selection signal for sub woofer channel “L”: LFE, “H”: Subwoofer out from M61537
2	SURR CHANNEL SELECT	O	Signal path selection signal for surround channel “L”: SL/FR (MTK), “H”: Tone out from M61537
3	SM LATCH 3	O	Serial data latch pulse output to the S-Master Processor
4	SIRCS	I	Remote control signal input
5	NO USE	I	Not used. (Open)
6	NO USE	I	Not used. (Open)
7	NO USE	I	Not used. (Open)
8	BYTE	—	Ground pin
9	CNVSS	—	Ground pin
10	XC IN	I	Sub system clock input (32.768 kHz)
11	XC OUT	O	Sub system clock output (32.768 kHz)
12	RESET	I	System reset signal input from the reset signal IC “L”: reset After the power supply rises, “L” is input for several hundreds msec and then change to “H”.
13	X OUT	O	Main system clock output (5 MHz)
14	VSS	—	Ground pin
15	X IN	I	Main system clock input (5 MHz)
16	VCC	—	Power supply pin (+3.3 V)
17	NMI	I	Non-maskable interrupt input
18	NO USE	I	Not used. (Connect to ground.)
19	NO USE	I	Not used. (Open)
20	AC CUT	I	AC off detection signal input from the reset signal IC “L”: AC Cut detected
21	VIDEO MUTE	O	Video muting on/off control signal output “L”: muting on
22	VIDEO OUT SW	O	Composite video output switching output control “L”: DVD VIDEO output, “H”: VIDEO VIDEO input
23	MIC DETECT	I	Microphone connection detection signal input “L”: headphone connected
24	KRMOD	I	Karaoke Mode detection signal input
25	MIC STATUS	O	Microphone status output to DVD Motherboard “L”: Microphone is not connected, “H”: Microphone is connected
26	MTK RESET	O	Reset signal output to DVD Motherboard “L”: reset
27	MTK XIFCS	I	Communication Initialization Request Acknowledgement Signal from DVD Motherboard
28	MTK BUSY	O	Communication Initialization Request Signal to DVD Motherboard
29	IIC CLK	I/O	Clock signal for IIC communication between the microcomputer and the IIC checker
30	IIC DATA	I/O	Data signal for IIC communication between the microcomputer and the IIC checker
31	MTK SIO	O	Serial data output signal to DVD Motherboard
32	MTK SOD	I	Serial data input signal from DVD Motherboard
33	MTK CLK	I	Serial data clock signal to DVD Motherboard
34	DVD A MUTE	O	DVD analog signal muting on/off control signal output “H”: muting on
35	MTK POWER	O	Power supply control signal to DVD Motherboard “H”: Power supply on
36	ST CE	O	PLL chip enable signal output to the tuner unit
37	MC DIN	I	PLL serial data input from the tuner unit
38	ST CLK	O	PLL serial data transfer clock signal output to the tuner unit
39	ST DIN/MC DOUT	O	PLL serial data output to the tuner unit
40	TUNED	I	Tuning detection signal input from the tuner unit “L”: tuned
41	OPEN SW	I	Eject detection signal input from CDM
42	TBL SENSE	I	Disc tray position detection signal input from CDM
43	E3	I	Disc tray status detection signal input from CDM
44	E2	I	Disc tray status detection signal input from CDM
45	E1	I	Disc tray status detection signal input from CDM
46	TM F	O	CDM turning motor control signal output

Pin No.	Pin Name	I/O	Pin Description
47	TM R	O	CDM turning motor control signal output
48	LM F	O	CDM loading motor control signal output
49	LM R	O	CDM loading motor control signal output
50	LED ILLUMINATION 1	O	Dynamic LED drive signal output to the ILLUMINATION 1st indicator and 2nd indicator "H": LED on
51	LED ILLUMINATION 2	O	Dynamic LED drive signal output to the ILLUMINATION 3rd indicator and 4th indicator "H": LED on
52	LED ILLUMINATION 3	O	Dynamic LED drive signal output to the ILLUMINATION 5th indicator and 6th indicator "H": LED on
53	LED CTRL	O	Dynamic LED drive select signal output
54	VOL A	I	Jog dial pulse input from the VOLUME rotary encoder (A phase input)
55	VOL B	I	Jog dial pulse input from the VOLUME rotary encoder (B phase input)
56	STBY LED	O	LED drive signal output of POWER indicator "H": LED is turned on
57	FL DRIVER DATA	O	Serial data output signal to FL Driver, NJU3427
58	FL DRIVER CLK	O	Serial data clock signal to FL Driver, NJU3427
59	FL DRIVER RESET	O	Serial data reset signal to FL Driver, NJU3427
60	FL DRIVER CS	O	Serial data chip select signal to FL Driver, NJU3427
61	SW LED	O	LED drive signal output of SUB WOOFER ON indicator "H": LED ON
62	VCC	—	Power supply pin (+3.3 V)
63	A HALF	I	Deck A cassette detection signal input "H": cassette detected
64	VSS	—	Ground pin
65	SM RESET	O	Reset signal output to the S-Master Power IC
66	IO EXP DATA OUT	O	Serial data output signal to I/O expander, BH2210V
67	NO USE	I	Not used. (Connect to ground.)
68	IO EXP RST	O	Reset signal output to the I/O expander, BH2210V
69	IO EXP CLK	O	Serial data latch signal to I/O expander, BH2210V
70	IO EXP LAT	O	Serial data clock signal to I/O expander, BH2210V
71	NO USE	I	Not used. (Connect to ground.)
72	SM SD	I	Shutdown (protector) detection signal from the S-Master power IC
73	DISPLAY KEY	I	DISPLAY key press detection signal (Interrupt input)
74	POWER KEY	I	POWER key press detection signal (Interrupt input)
75	NO USE	I	Not used. (Connect to ground.)
76	SM LATCH 1	O	Serial data latch pulse output to the S-Master Processor
77	SM CLK	O	Serial data transfer clock signal to the S-Master Processor IC (CXD9843)
78	SM DATA	O	Serial data output signal to the S-Master Processor IC (CXD9843)
79	SM LATCH 2	O	Serial data latch pulse output to the S-Master Processor
80	NO USE	I	Not used. (Connect to ground.)
81	NO USE/SW MUTE	O	GNZ88D: Not used. (Connect to ground.), GNZ77D: Subwoofer mute signal output
82	OUT2DLY SEL	I	PWM Mode selection signal "L": PWM Mode 3, "H": PWM Mode 4
83	M61537 DATA	O	Serial data output to audio signal processor, M61537FP
84	M61537 CLK	O	Serial data transfer clock signal output to audio signal processor, M61537FP
85	HP DET	I	Headphone connection detection signal input "H": headphone connected
86	HP MUTE	O	Headphone muting on/off control signal "H": muting on
87	NO USE	I	Not used. (Connect to ground.)
88	VACS IN	I	VACS level detection signal
89	A SHUT	I	Shut off detection signal input from deck A side reel pulse detector (A/D input)
90	B SHUT	I	Shut off detection signal input from deck B side reel pulse detector (A/D input)
91	B HALF	I	Deck B cassette detection and forward side recording tab detection signal input (A/D input)
92	MODEL IN	I	Model setting (A/D input)
93	DEST IN	I	Destination setting (A/D input)
94	AD KEY 3	I	Key signal input (A/D input)
95	AD KEY 2	I	Key signal input (A/D input)

Pin No.	Pin Name	I/O	Pin Description
96	AVSS	—	Ground pin
97	AD KEY 1	I	Key signal input (A/D input)
98	VREF	I	A/D Converter reference voltage input (+3.3 V)
99	AVCC	—	Power supply pin (+3.3 V) (for A/D conversion)
100	MAIN ON/OFF	O	Main power on/off control signal output “H”: power on

IC403 BH2210FV-E2 (SIGNAL IN/OUT CONTROL) (MAIN BOARD (2/4))

Pin No.	Pin Name	I/O	Pin Description
1	CTLIO	I	IN/OUT control port (Fixed at “H” in this set.)
2	RESET	I	Reset signal input
3	CLK	I	Serial data clock signal input
4	LATCH	I	Serial data latch signal input
5	TC-MUTE	O	Tape playback muting on/off control signal output “H”: muting on
6	NO USE	O	Not used. (Open)
7	REC MUTE	O	Recording muting on/off control signal output “L”: muting on
8	NO USE	O	Not used. (Open)
9	SM-NSP-MUTING	O	S master processor IC PWM 50% duty muting on/off control signal output “L”: muting on
10	SM-SOFT-MUTING	O	S master processor IC soft muting on/off control signal output “L”: muting on
11	SM-PG-MUTE	O	S master processor IC PWM muting on/off control signal output “L”: muting on
12	SM-INIT	O	Initialization signal to the S master processor IC
13	LATCHO	O	Serial data latch output signal Not used. (Open)
14	CLKO	O	Serial data clock signal output Not used. (Open)
15	DO1	O	Serial data signal output 1 Not used. (Open)
16	DI2	I	Serial data signal input 2 Not used. (Connect to ground.)
17	A-TRIG	O	Deck A side trigger plunger drive signal output “H”: plunger on
18	CAMP-CNT	O	Capstan motor drive signal output
19	B-TRIG	O	Deck B side trigger plunger drive signal output “H”: plunger on
20	REC BIAS	O	Recording bias on/off control signal output “H”: bias on
21	TC RELAY	O	Recording/playback selection signal output “H”: recording, “L”: playback
22	ADC RESET	O	Power down control signal to analog to digital converter “L”: power down
23	NO USE	O	Not used. (Open)
24	FAN CTRL	O	Fan driving signal output “L”: fan on
25	DO2	O	Not used. (Open)
26	DI1	I	Serial data signal input
27	VSS	—	Ground pin
28	VDD	—	Power supply pin (+3 V)